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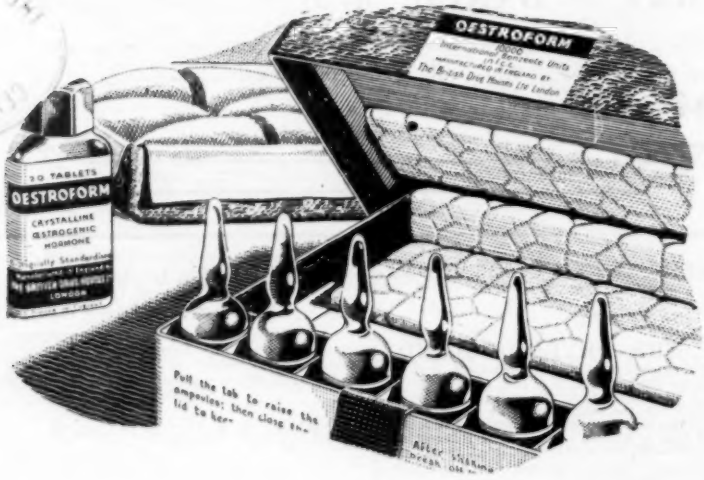

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03

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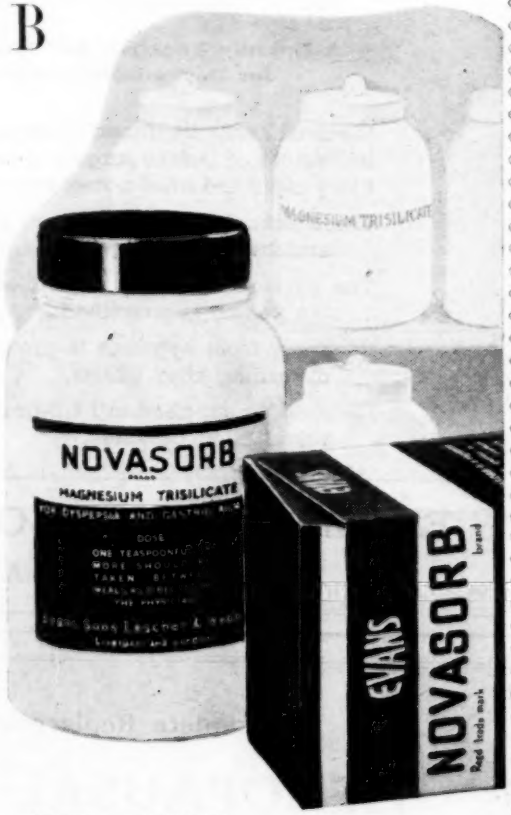

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[1] *J. Amer. med. Assoc.* (1941) 117, 1496.
[2] *Lancet* (1940) 1, 10.

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EPILEPSY FOLLOWING APPLICATION OF SULPHATHIAZOLE NEAR THE BRAIN

A. C. WATT, M.B. EDIN. G. L. ALEXANDER, F.R.C.S.

(Brain Injuries Unit, Edinburgh; and Wilkie Surgical Research Laboratory, University of Edinburgh)

THE purpose of this paper is to draw attention to the danger of applying sulphathiazole in proximity to the brain, particularly in the frontal region. The local application of the sulphonamides in actually or potentially contaminated wounds has recently acquired some popularity. The bone-flap in many craniotomy operations is necessarily largely deprived of blood-supply and may be regarded virtually as a free auto-graft, so that even aerial contamination may become important in such operations. Accordingly the local use of chemotherapeutic agents as a prophylactic against possible infection in primary operations has been adopted in many neurosurgical centres.

When sulphathiazole became available we applied it in the same manner as had been our practice with sulphapyridine. Two to three grammes of the powdered drug, sterilised in the autoclave, was insufflated into the wound after closure of the dura mater, both deep and superficial to the bone-flap. The closure of the dura mater was, as usual, never complete enough to prevent cerebrospinal fluid from percolating through and thus gaining direct contact with the sulphathiazole powder. All went well with the first two cases, then we began to have postoperative complications intermittently, in the form of epileptic seizures in quick succession, beginning about two hours after operation. There were 2 deaths in the 5 cases exhibiting this train of symptoms.

CASE-RECORDS

The following brief case-records are given chronologically; cases 3 and 7–10 were complicated by epilepsy.

CASE 1.—Man, aged 44. Lateral bone-flap craniotomy for removal of postfrontal meningioma; 3 g. sulphathiazole. No postoperative epileptic symptoms.

CASE 2.—Man, aged 30. Four years' history of focal epilepsy due to left parietal meningioma. Lateral bone-flap; tumour removed; 3 g. sulphathiazole. No postoperative complications *in spite of history of epilepsy.*

CASE 3.—Man, aged 35. Pituitary adenoma. Left frontal intradural approach; intracapsular removal. Multiple punctures made in arachnoid to drain large fluid lakes in sulci and facilitate retraction of brain; 3 g. sulphathiazole applied as described above. An hour after return from theatre there were three fits in quick succession, generalised but more severe on right side. Chloroform inhalation and intramuscular phenobarbitone soluble given; 10 min. after cessation of chloroform there were four fits within 15 min. Spinal puncture: low pressure, slightly blood-stained fluid (not examined for sulphathiazole concentration). Fits continued throughout the night at intervals of 2–30 min. in spite of a total of gr. 10 phenobarbitone soluble and rectal paraldehyde. About 150 fits recorded in first 20 hours, after which they ceased. No hyperthermia and respirations 24–30 between attacks. Gradual improvement, but return of consciousness very incomplete. Spinal puncture, 24 hours after onset: 100 mm. pressure, fluid as before. On third day condition was slowly deteriorating, not improved by 'Icoral' or intravenous sucrose; gaseous distension of abdomen. Shortly before death on fourth day two pints of bright red blood was vomited.

At autopsy the tumour in the region of the sella turcica was found to be very large and extending into adjacent structures. The brain showed some generalised flattening of cerebral gyri and a deep impression due to pressure by the tumour in the region of the interpeduncular fossa. Nothing unusual was noted in the vicinity of the operation wound, and there was no obvious source of the blood vomited before death. A small amount of sulphathiazole was still discernible extradurally.

CASE 4.—Man, aged 22 years. Hand-grenade accident; compound fracture in frontal region. Localised craniectomy *without opening of dura* some weeks after accident: about 2·5 g. sulphathiazole. No epileptic disturbance.

CASE 5.—Man, aged 37. Parieto-occipital bone-flap craniotomy for removal of tumour at inferolateral border of occipital lobe; 3 g. sulphathiazole. Convalescence uneventful.

CASE 6.—Woman, aged 46. Left parietal bone-flap craniotomy for exposure of parasagittal meningioma; tumour not removed, arachnoid not extensively opened, dura not closed; 2–3 g. sulphathiazole. Subsequent X-ray therapy. Convalescence uneventful.

CASE 7.—Man, aged 25. Left frontal intradural approach for suprasellar pituitary epidermoid; tumour removed. Ventricle tapped through dura early in exposure; 3 g. sulphathiazole applied during closure. Six generalised epileptic attacks from second to twelfth hour after operation; no further symptoms. Very incomplete recovery of consciousness until attacks ceased.

No family or personal history of epilepsy in this case.

CASE 8.—Woman, aged 48. Orbital neurofibroma; right frontal craniotomy and removal of roof of orbit. *Dura merely punctured* to permit tapping of anterior horn of ventricle in order to facilitate exposure; 0·5 g. sulphathiazole inserted deeply in operation field and 0·5 g. sulphapyridine placed superficial to bone-flap. Immediate postoperative recovery normal. Six hours after operation, five generalised epileptic attacks with unconsciousness, duration 1–2 min. each. Fits readily controlled by chloroform inhalation and phenobarbitone soluble. Subsequent progress uneventful.

CASE 9.—Woman, aged 25. Extensive right frontal lobectomy for tumour; dura sutured; 2·5 g. sulphathiazole applied only to outer aspect of bone-flap. Seven focal epileptic attacks of one minute's duration, 1½–6 hours after operation. Left side of face and neck involved, no generalisation. No further epileptic symptoms thereafter, but recovery of consciousness was delayed until after the epileptic phase.

CASE 10.—Woman, aged 67. Right frontal approach to pituitary tumour, intracapsular removal; sulphathiazole 2–3 g. applied after closure of dura. Remained unconscious; 2 hours after operation epileptic attack began on left side of body and then became generalised; duration 1½ min. Phenobarbitone soluble gr. 3 intramuscularly, in spite of which five similar attacks observed in next 40 min. Chloroform inhalation for 20 min. and 3 min. thereafter attacks recurred with increasing frequency until the interval between each was less than 3 min.; duration 1½ min. Chloroform inhalation repeated four times during the night for periods from 25 to 90 min., giving only very temporary relief from attacks. After each inhalation the first few fits were milder and confined to the left side of the face but soon regained their former characteristics, always beginning on the left side of the body. During the second day the fits became fewer and ceased at 7 P.M. Thus in the first two days the patient had over 200 fits all similar in character; she had not recovered consciousness. On the third day she improved sufficiently to be able to make some response to stimuli and questions, and began to swallow fluids. Spinal puncture: 200 mm. pressure, slightly blood-stained fluid. By this time signs of congestive heart-failure were becoming evident, consequent on the exhaustion occasioned by the epilepsy. She died on the fourth day after operation. Autopsy not permitted.

Chemical assay of total sulphathiazole (combined and free; method of Marshall and Litchfield) in the lumbar field 48 hours after operation gave the finding of 8·9 mg. per 100 c.cm., and in fluid aspirated from under the scalp flap the significantly high figure of 13·8 mg. per 100 c.cm. Spinal fluid immediately after death contained 14·8 mg. of the compound per 100 c.cm.

COMMENT

In this series of 10 craniotomies in which sulphathiazole was used, 5 of the 6 frontal explorations were complicated by postoperative epilepsy. Death resulted from status epilepticus in two of these cases, both of which were explorations for pituitary tumour. In the remaining frontal operation not complicated by epilepsy the thickened dura was not opened; this is significant. None of the affected patients had either a personal or family history of epilepsy. It is further to be noted that in the four cases of lateral or posterior craniotomy epilepsy did not occur, *not even in case 2 with a history of previous epilepsy.* Case 8 (orbital tumour) is of particular interest in that the dura and ventricle were merely punctured, and in this instance initial recovery of consciousness was average and the onset of fits was delayed until six hours after operation; moreover the

attacks were readily controlled and soon ceased. In case 9, only the external surface of the bone-flap was treated with powder and although the basal fluid spaces were opened extensively the epileptic attacks were focal and relatively mild. A contributory alleviating factor may have been dilution of dissolved sulphathiazole by the large volume of fluid occupying the cavity resulting from the lobectomy.

The general inference to be drawn is that the factors favouring development of epilepsy in these cases were the free opening of the cisternal spaces of the anterior basal region, and the placing of the drug so as to be freely accessible to the fluid of those spaces. After frontal craniotomy, cerebrospinal fluid commonly accumulates under the scalp-flap in considerable quantity, more so than after lateral craniotomy, and thus a copious reservoir of fluid saturated with sulphathiazole can be formed superficially. If, as is often the case, intracranial tension is low after operation, the tidal excursion of fluid through apertures in the dura mater at each pulse-beat contributes to rapid diffusion of the drug in solution within the cranial cavity.

Interspersed with these 10 cases chronologically, and all treated with sulphathiazole locally, were several instances of scalp wounds without underlying fracture, two cranial exploratory burr-hole operations, two removals of cerebellar tumour, one occipital compound fracture involving craniectomy above and below the lateral sinus with exposure of the contents of the posterior fossa, and two laminectomies (one cervical). None of these patients showed any evidence of postoperative epilepsy. In both the cerebellar cases the tumour was so situated that after surgical interference considerable immediate neurological dysfunction was to be anticipated, and was observed. No clear parallel can therefore be drawn between these two cases and the posterior-fossa experiments recorded below.

The dosage employed in each case is probably not important, owing to the relative insolubility of sulphathiazole, and it may be assumed that the drug was present in excess at least in the first day or two. Sulphathiazole is soluble in water at 20° C. only to the extent of about 1/2500 (40 mg. per 100 c.cm.); the solubility is greater at body temperature, and amounts up to 104 mg. per 100 c.cm. have been recovered from wound fluid (Ewins, A. J. quoted by Hawking 1941). The finding of as much as 14·8 mg. per 100 c.cm. of the compound in the lumbar fluid (case 10, immediately after death) indicates that quite high local concentration may be reached in the fluid of the subarachnoid spaces at the site of operation.

Other neurosurgeons in this country have told us of their experience with sulphathiazole. Surgeon Captain Lambert Rogers had one case, involving a frontal bone-flap craniotomy for old compound depressed fracture, the dura being opened. Powder (either sulphanilamide or sulphathiazole) was applied after the frontal lobe had been covered with a sheet of amnioplastin. The patient recovered consciousness but later had numerous fits and became unconscious. The bone-flap was re-elevated 12 hours after operation but nothing untoward was found; more of the powder was applied. Epileptic fits soon recurred and the patient became hyperthermic, dying 24 hours later. There was later some doubt whether the powder used was indeed sulphathiazole, but the case so parallels those recorded here that there is good reason to suppose sulphathiazole was used. Moreover it seems to be the general experience that sulphanilamide and sulphapyridine may be used freely on the cerebral surface without risk of epilepsy.

Mr. D. W. C. Northfield implanted 2 g. of sulphathiazole widely into the posterior fossa after total removal of a tumour of the cerebellopontine angle without observing associated ill effects. This is in accord with our clinical experience.

Lieut.-Colonel E. H. Botterell informs us that Lieut.-Colonel W. V. Cone, now overseas, used a mixture of approximately two parts sulphanilamide, two parts sulphathiazole and one part sulphapyridine, only a very thin layer being left on the brain surface, and that in a relatively small series they observed no epileptic complications with this mixture. Unfortunately a survey of this material is not at present possible owing to transfer of records, and in particular the number of frontal explorations involved cannot be ascertained.

SULPHAPYRIDINE

Our experience with sulphapyridine has included 26 supratentorial exposures (more than half of them in the frontal region), and 5 cerebellar operations. In all, postoperative recovery of consciousness was average and convalescence was uneventful, with the exception of the following case.

Man, aged 19, acromegaly and gigantism. He was a bad operative risk on account of cardiac disease, but action had to be taken to preserve vision. By the trans-sphenoidal route access was gained to the adenoma, and during the operation it was noted that the basal subarachnoid space had been entered. Accordingly about 0·5 g. sulphapyridine was insufflated into the tumour cavity. From the prompt onset of polyuria, and blood-staining of the CSF, operative damage to the tuber was inferred. Recovery of consciousness was incomplete. 28 hours after operation the patient passed into coma lasting nearly 2 hours, with initial epileptiform symptoms. After some improvement the general condition progressively deteriorated without further epilepsy, and the patient died 52 hours after operation. Autopsy not obtainable.

The clinical picture was for the most part that of spreading hypothalamic thrombosis, though there was undoubted epilepsy in the syndrome for a short period. With such direct access to the basal fluid spaces sulphapyridine may possibly have been responsible for the epileptic symptoms, but this seems improbable in view of our experience with transfrontal pituitary operations, corroborated further by the experimental work referred to later. On the basis of this single and exceptional case it is not possible to associate local application of sulphapyridine with subsequent epileptic manifestations.

EXPERIMENTAL OBSERVATIONS

Experiments were undertaken in dogs and cats to elucidate several points arising out of this clinical experience. The application of sulphathiazole to the cerebral surface was followed by an epileptic syndrome comparable to that observed clinically. Sulphapyridine similarly applied was not associated with epilepsy; nor were sulphadiazine or sulphacetamide. Sulphanilamide was not used in this investigation since it was considered that clinical observations, and the experimental work of Russell and Falconer (1940) and Botterell and others (1941), with sulphanilamide provided sufficient evidence against its association with epileptic manifestations. It had been our practice to sterilise the sulphathiazole powder for use in operations in the autoclave as recommended by the manufacturers; the possibility that some chemical change might have occurred in the process and might be responsible for the convulsant property of the powder was soon disproved. Unsterilised powder obtained by crushing a tablet intended for oral administration was fully as effective experimentally. By courtesy of the American Hospital in Great Britain a supply of sulphathiazole of American manufacture was provided; this proved equally potent.

Experiments with sulphathiazole.—In four cats (weights 1·6–2·5 kg.), under intratracheal ether anæsthesia, sulphathiazole in dosage of 0·14–0·23 g. was applied to the cerebral surface over the fronto-temporal area, just behind the cruciate sulcus, the arachnoid being left intact. All but one developed epilepsy 1–2 hours later. The attacks were focal; the contralateral face, ear and neck muscles showed typical tonic-clonic sequence recurring every 3–5 min. and lasting 5–15 sec. The onset was sudden; consciousness was not definitely lost while the attack was in progress but reflex reaction to tactile and auditory stimuli was reduced or almost in abeyance and pupils were dilated, reacting poorly to light. Each attack ceased abruptly and normal activity was promptly resumed. The attacks were most marked about six hours after the application of the sulphathiazole and ceased 12–18 hours later.

In two cats the powder was applied over the occipito-temporal region and free egress of fluid was assured by multiple punctures in the arachnoid. Dosage of the drug was similar. The development of the epilepsy was as previously, but soon each attack, initially focal, became generalised, with salivation and snapping of the jaws, and consciousness was lost. The maximal duration was 2 min. and the interval between those major attacks was 20–30 min., largely occupied in sleep. Often as another major attack was imminent larval focal attacks appeared, increasing in

frequency and severity until the outburst of the major fit. It seems probable that the freer diffusion of the drug into the subarachnoid space in these two animals promoted the well-marked epileptic display observed and allowed a higher concentration of dissolved sulphathiazole to bathe the surface of the brain than in the preceding experiments.

In two further cats, sulphathiazole was applied to the lower surface of the frontal lobe well down towards the base, some of the drug also coming in contact with the lateral part of the sensori-motor cortex in the region of the cruciate sulcus (dosage 0·2 and 0·86 g. respectively); a frontal approach was used and the upper and lower walls of the frontal sinus on the side of operation were removed to gain the necessary access. Also in two dogs of 7 and 9 kg. the drug was applied, by temporal approach, in the middle fossa as far medially as the carotid artery and pituitary, the basal cistern being opened (dosage 0·3–0·4 g.). Here again some of the drug was in contact with the lower part of the motor cortex. The epileptic sequelæ were severe and prolonged. The attacks began focally as in the first experiments, within the hour, increased in severity, and soon each terminated in generalised tonic-clonic involvement accompanied by snapping of the jaws, salivation, arrest of respiration and unconsciousness. Duration 1–2 min.; rather abrupt cessation followed by panting and somnolence; frequency every 3–10 min.; total duration of the epilepsy 36–48 hours.

Thus sulphathiazole was applied to the cerebral surface on 10 occasions, with 9 positive results. None of the animals succumbed and all recovered normal function. The resultant epilepsy was most severe when the substance was applied to the base of the brain and seemed also to have some relation to the freedom with which the sulphathiazole could diffuse into the subarachnoid space and basal cisterns.

Five control experiments with sulphapyridine in similar dosage were entirely negative. The animals were three of the cats and the two dogs of the preceding sulphathiazole experiments; in each the sulphapyridine was applied symmetrically to the opposite hemisphere subsequent to the sulphathiazole experiment.

Sulphadiazine and sulphacetamide ('Albucid') proved quite innocuous.

Sulphadiazine (0·12–0·47 g.) was applied to the anterior basal region of the brain subdurally in two cats, and to the brain surface in the anterior parietal region after multiple puncture of the arachnoid in one cat. Neither epilepsy nor signs of focal cerebral dysfunction were noted thereafter.

Exactly similar procedures on three cats, using sulphacetamide (0·18–0·32 g.), likewise occasioned no disturbance.

Posterior-fossa experiments.—Although the small clinical experience of Mr. Northfield and ourselves with sulphathiazole applied in the posterior fossa gave no reason to suspect complications, Colonel Hugh Cairns has had one instance of epilepsy following application of sulphapyridine to the cerebellum. It was therefore desirable to put the matter to experimental test. Circumstances have prevented more than a small number of experiments in this part of the investigation.

In three cats the posterior fossa was opened, exposing the vermis and part of each lateral cerebellar lobe. The roof of the fourth ventricle was also opened up. Sulphathiazole (0·47–0·56 g.) was applied to the exposed brain and the neck muscles were sutured in place. All three animals developed a more or less well-marked "cerebellar" syndrome, the outstanding features of which were imbalance and broad-based stance, hypotonia (especially of the forelimbs), and nystagmus. No vomiting; but little or no food was taken for several days. One of the three, in which the exposure had been carried particularly far laterally on each side, also developed epilepsy about 5 hours after operation, differing from the fits of the preceding experiments in preliminary neck-retraction with tonic extension of the forelimbs, proceeding in 7–10 sec. to lateral flexion of the neck, twitching of the eyelids and face bilaterally, generalised clonic movements, snapping of the jaws and salivation; duration 20–30 sec. in groups of two or three attacks in quick succession every 15–30 min. Each attack ceased suddenly and there was no somnolence. The attacks persisted with diminishing frequency and severity for 36 hours, leaving the ataxia and other phenomena noted above. Recovery was complete in 4–7 days in all three animals.

In two similar experiments on cats with sulphapyridine (0·33 and 0·37 g.) the animals recovered normally and showed no evidence of cerebellar dysfunction. This was in agreement with our clinical experience.

It seems therefore a warrantable inference that sulphathiazole may be harmful when applied to the cerebellum in man. Such a possibility cannot be excluded in our two cases, unfortunately both with large cerebellar tumours extending widely, and the considerable cerebellar dysfunction observed was to be expected for a time after operation. Although both patients made good functional recoveries initial convalescence might possibly have been more rapid had sulphathiazole not been used. Mr. Northfield, however, thinks that his case showed no unusual postoperative disturbance.

Histology.—Further observations planned for histological purposes are necessary before conclusions can be drawn. In most instances in the above work the animal was preserved for some weeks for continued observation and at autopsy the implanted drug had disappeared or, in much reduced quantity, was compacted into a white plaque separated from the adjacent tissues by a thin layer of organising exudate. The animals of the posterior-fossa experiments were killed earlier, as soon as the ataxia and other signs had disappeared. Preliminary evidence available from this limited material suggests that sulphathiazole in particular may have a pronounced local neurolytic effect on Purkinje cells in addition to setting up a considerable glial reaction in the cerebellar cortex

DISCUSSION

There are an increasing number of reports of toxic effects following continued oral or parenteral administration of the sulphonamides, but with the exception of a report by Roseman and Aring (1941) of one case of hæmorrhagic encephalitis following sulphamethylthiazole (112 g. in five days), in which terminal convulsions occurred, there is no reference to epilepsy. Hurteau (1941), in a research planned to investigate whether the sulphonamides had any unfavourable effect on healing of wounds of the brain, employed sulphathiazole in 7 cats and makes no mention of epileptic sequelæ. His procedure involved the coring-out of a cylinder of cortex 0·5–1 cm. in diameter, and after implantation of 70–110 mg. of the drug the cerebral wound was covered over with amnioplastin, so as to keep the drug localised. It may be presumed that this intention was realised and that sulphathiazole diffused into the neighbouring subarachnoid spaces in concentration too low for epilepsy to be induced. Nevertheless, the foregoing observations show that when applied in powder form on or near the cerebral surface sulphathiazole is a powerful epileptogen. The syndrome resulting, both clinically and experimentally, has the characteristics of a true epilepsy. This epileptogenic property is not shared by sulphanilamide, sulphapyridine, sulphadiazine or sulphacetamide and therefore seems to be associated with the thiazole part of the molecule; this possibility is under investigation.

It will be noted that in the clinical cases recorded here epilepsy was observed after the frontal explorations alone—operations in which with one exception the basal fluid spaces had been exposed and opened. In the animal experiments no such exclusive localisation of the convulsant effect was apparent, though the epilepsy was most severe and persistent when the anterior basal region of the cerebrum was chosen for experiment.

Sulphathiazole may have some harmful effect on the cerebellum, as suggested in the small series of posterior-fossa experiments on cats. The one instance of epilepsy in this series was of interest in that neck-retraction and tonic extensor rigidity of the forelimbs were in evidence before the clonic phase appeared. Rather similar tonic attacks are seen clinically in some cases of compression of the midbrain by tumour and in traumatic lesions involving the midbrain.

SUMMARY

Five cases of epilepsy following application of sulphathiazole in proximity to the brain in the frontal region are reported.

This epileptogenic property of sulphathiazole has been confirmed experimentally in animals, and is apparently not shared by sulphanilamide, sulphapyridine, sulphadiazine or sulphacetamide.

Continued at foot of next page

NEUROSIS IN SOLDIERS

A FOLLOW-UP STUDY

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In neurosis centres where most of the patients are soldiers, the success of treatment must be judged by the proportion of those treated who are able to resume and continue at military duties. It is misleading to judge it by the proportion of those treated who, by the time they leave hospital, are either free of symptoms or merely thought likely to be able to carry out their military duties. Neurotic illness is so dependent on circumstances, and especially on the stresses of the soldier's life, from some of which he is free while in hospital, that his condition after some weeks in this relatively sheltered place is not a sure indication of his fitness. Conclusions about the success of treatment must therefore be based on condition 3 months, 6 months or more after discharge. As with the assessment of treatment so with the assessment of prognosis. It is not sufficient to weigh the likely prognostic factors in men who are apparently well on discharge from hospital against those in men who are invalided from the Army by a medical board because the hospital doctors and others think them unsuitable; that would only show the factors determining doctors' opinions about probable fitness for military duty. It is necessary to compare groups in whom a trial of fitness after treatment has been made in the Army and the outcome ascertained.

In each of the two hospitals in which we work two groups were compared: one made up of men who on inquiry some months after discharge from hospital were doing full duty in the Army efficiently and willingly; and the other of men who sooner or later after return to duty had been discharged from the Army under para. 390 (XVI) K.R. 1940 as ceasing to fulfil Army physical requirements. The groups consisted in the one hospital of 100 men each, and in the other hospital of 50 men each; in all, therefore, 150 men on full duty were compared with 150 men who had been discharged. The samples were selected by taking all successive names, up to the required number, in the lists of men on whom the follow-up questionnaire had been answered by the commanding officer of the man's unit. The records of these men had been compiled by many psychiatrists in the two hospitals; the extraction of data from the records was done by one person in each hospital. It was therefore unlikely that in the group as a whole individual bias could have greatly influenced what observations were made and recorded and unlikely that the extraction of the relevant data from the records was done inconsistently. The conditions were thereby laid down for a statistically unobjectionable controlled experiment, such as is but seldom possible in clinical medicine.

We took, first, 35 attributes which from experience and common belief might be thought of prognostic significance in cases such as these. It soon became evident that some of them could not profitably be included; a reduced list of 20 attributes was finally taken, and the presence or absence of each attribute in the individual patients determined (table I). Combining our figures, the significant differences between the "full duty" sample and the "discharged" are in respect of these attributes: positive family history; unsatisfactory work record; psychopathic traits of personality; symptoms of the present illness before enlistment; previous dislike of Army service, keenness to get back to Army duty; exposure to Dunkirk or other severe stress of bombardment and active service; querulous hypochondriacal complaints; amnesic phase; surly paranoid attitude.

In every case the difference is to the disadvantage of the discharged group, keenness to get back to the Army and exposure to severe stress counting as favourable attributes, the rest as unfavourable ones. In the case of all these attributes the difference between the two groups is more than twice its standard error, the actual ratio being given in the last column of the table; but a glance down the table shows that there are consistent differences between the two groups in respect of all the other attributes, though they are not large enough to have, individually, statistical significance. In a few cases the difference is trifling—for instance, there is little difference shown in the average time spent in hospital, and in the frequency of anxiety symptoms or of an adequate precipitating cause (a favourable feature). In 2 cases the difference between the two groups is not quite what one might expect. The presence of depressive symptoms is shown to be favourable rather than otherwise; and there is a surprisingly small difference between the two groups in the frequency of the grosser degrees of stupidity as shown by school record. One of us who first employed a less strict criterion (standard 6 or lower) obtained a larger difference between the two groups; but it was thought better to maintain the general rigour of definition throughout the table. A "positive family history," for instance, means that at least one person among the patient's parents or siblings had an actual psychiatric illness for which he has been treated, or had shown a sufficiently gross degree of psychiatric abnormality to lead to social consequences. The appearance

TABLE I—FREQUENCY OF CERTAIN FEATURES IN MEN ON FULL DUTY, AND IN MEN DISCHARGED FROM THE ARMY, SOME MONTHS AFTER TREATMENT IN HOSPITALS A AND B

—	FULL DUTY		DISCHARGED		TOTAL		Ratio diff. to S.E of diff.
	A (50)	B (100)	A (50)	B (100)	Full duty (150)	Discharged (150)	
Family history positive	13	30	20	44	43	64	2·6
Poor school record (St. 5 or lower)	6	9	6	11	15	17	
Unsatisfactory childhood	17	27	23	33	44	56	
Unsatisfactory work record	11	6	19	11	17	30	2
Psychopathic traits before	19	34	39	58	53	97	5·3
Previous neurotic breakdown	10	11	12	21	21	33	
Symptoms before enlistment	21	13	37	38	34	75	5·1
Duration of stay in hospital (av. days)	46	33	51	36	39	43	
Dislike of Army in the past	5	7 (of 50)	19	9 (of 50)	12 (of 100)	28 (of 100)	2·8
Keen to go back to Army now	21	23 (of 50)	12	10 (of 50)	44 (of 100)	22 (of 100)	3
Strain (Dunkirk, &c.)	17	29	8	21	46	29	2·3
Adequate external cause	21	63	15	60	84	75	
Physical factor complication	10	25	14	32	35	46	
Conversion symptoms	11	17	18	22	28	40	
Querulous hypochondriasis	6	8	20	11	14	31	2·9
Depressive symptoms	21	44	22	36	65	58	
Anxiety symptoms	29	56	31	60	85	91	
Fugue, amnesia	2	8	13	10	10	23	2·4
Surliness; paranoid attitude	4	8	8	14	12	22	2·3
Fits and faints	7	6	8	12	13	20	

S.E. = Standard error.

DR. WATT, MR. ALEXANDER (*continued*)

We are indebted to Mr. Norman Dott for the opportunity of recording these observations, and to him and Prof. J. R. Learmonth for their criticism; also to the American Hospital in Great Britain, Dr. John Martin of Chicago, and Dr. J. M. Robson for providing us with some sulphonamide compounds not readily procurable. Dr. William Blackwood assisted in the interpretation of the histological material. The expenses of the investigation were met by grants from the Earl of Moray Fund and the Wilkie Surgical Research Fund of the University of Edinburgh.

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TABLE II—ATTRIBUTES WHICH WERE FOUND IN SIGNIFICANTLY DIFFERENT PROPORTIONS IN THE TWO HOSPITALS

—	Hosp. A (%)	Hosp. B (%)	Ratio diff. to its standard error
Unsatisfactory work record:			
Full duty	22	6	2·5
Discharged	38	11	3·6
Symptoms before enlistment:			
Dull duty	42	13	3·7
Discharged	74	38	4·6
Psychopathic traits before:			
Discharged	78	58	2·6
Dislike of Army in past:			
Discharged	38	18	2·3
Adequate external cause:			
Full duty	42	63	2·5
Discharged	30	60	3·7
Querulous hypochondriasis:			
Discharged	40	11	3·8
Fugue, amnesia: Discharged	26	10	2·3

of any attribute in the table depends on its having been reported in the notes: it is therefore likely that the figures, say, for "dislike of Army service," "keenness to return to the Army" or "querulous hypochondriasis" indicate only those in whom these features were prominent. In one of our hospitals only half the material could be utilised for the recording of the first two of these attributes—i.e., only those cases admitted after a time when the recording of these factors had shown itself to be important.

Two different collections of statistical material cannot be combined for analysis unless it can be shown that there are not significant differences between the one collection and the other. Therefore our two collections were compared with each other (table II). It was found that the difference between the two hospitals was more than twice its standard error in respect of the following attributes: unsatisfactory work records, symptoms before enlistment, adequate external cause (difference significant in both full duty and discharged groups); and previous psychopathic traits, dislike of the Army, querulous hypochondriasis and fugue (difference significant in the discharged group only). It is probable that these differences are due to systematic differences between the two hospitals in the attention paid to these attributes, or the degree to which they had to be present before they were recorded, or possibly to a difference in the nature of the clinical material. It would therefore be unsafe to combine the two sets of figures for the purpose of getting any *absolute* proportions. This procedure would in any case be of little value because one has no wish to know the absolute frequency of, say, a positive family history in a special group of neurotics who were returned to duty, though its frequency in the general run of military neurotic patients would admittedly be of interest. Furthermore our method of recording the presence or absence of an attribute did not provide for any variation in its intensity and such findings as "poor work record" might have been much more widely assessed by other investigators.

But we are not concerned here with absolute frequencies but with differences or *relative* frequencies, and for this purpose our two collections of material can be safely combined. When, of all persons showing a given attribute, the proportion having a bad subsequent record is compared with the proportion who subsequently did satisfactorily (table III), the differences between the two hospitals fade away. In no case do the proportions calculated in the one hospital and the other differ by an amount approaching twice its standard error. We can therefore say that in demonstrating the psychiatric differences between men with good and bad posthospital records the findings of our two hospitals confirm each other.

TABLE III—PROPORTION OF THOSE WITH OMINOUS ATTRIBUTES IN EACH HOSPITAL WHO WERE SUBSEQUENTLY DISCHARGED FROM THE ARMY AS UNFIT

Attribute	Hospital A			Hospital B			% Difference	S.E. %
	No. +	No. dischd.	%	No. +	No. dischd.	%		
Unsatisfactory family history	33	20	60·6	77	44	57·2	3·5	..
Poor school record	12	6	50	20	11	55	5	..
Unsatisfactory childhood	40	23	57·5	60	33	55	2·5	..
Unsatisfactory work record	30	19	63·3	17	11	64·7	1·4	..
Psychopathic traits before	58	39	67·3	92	58	63	4·2	..
Previous neurotic breakdown	22	12	54·5	32	21	65·6	11·1	..
Symptoms before enlistment	58	37	63·8	51	38	74·5	10·7	..
Dislike of Army in past	24	19	79·2	16	9	50·6	28·6	15
Not keen to go back to Army now	33	21	63·6	33	23	69·7	6·1	..
Dunkirk, &c. not experienced	25	17	68	50	29	58	10	..
No adequate external cause	36	21	58·3	23	63	51·2	7·1	..
Physical factor or complication	24	14	58·3	57	32	56·1	2·2	..
Conversion symptoms	29	18	62·1	39	22	56·4	5·7	..
Querulous hypochondriasis	25	20	76·9	19	11	57·9	19	14
Depressive symptoms	43	22	51·2	80	36	45	6·2	..
Anxiety symptoms	60	31	51·3	116	60	51·7	0·3	..
Fugue, amnesia	15	13	86·7	18	10	55·6	31·1	14·6

SIGNIFICANCE OF OMINOUS ATTRIBUTES

The failure, already mentioned, to allow for different intensity of manifestation probably weakens our next step, which was to see whether the ominous attributes (those which were significantly more common in the men discharged from the Army) occurred together with such frequency in individuals that a mere counting of them might have prognostic value. In other words, could it be shown that the occurrence in any individual of, say, five or more ominous attributes indicated an almost certain discharge from the Army, or that the occurrence of not more than one of the attributes in any individual meant that he had a good chance of doing well? The weakness of this lies in the lumping together of attributes irrespective of their degree of severity in the individual patients, and in the concentration on ominous attributes without paying attention to the auspicious attributes. We were aware of this omission, but considered it impracticable to deal statistically with the large number of favourable factors, though of course these had played the chief part in bringing about the permanent or temporary return to military duties, on discharge from hospital, of almost all the patients studied. One of us first compared the number of men in each of his two groups of 50 who had one, two, or more, ominous attributes, with the following results:

No. of ominous attributes	0	1	2	3	4	5	6	7	8	9	10
No. of "full duty" men with that no. of attributes	3	11	10	5	7	5	6	1	2	0	0
No. of "discharged" men with that no. of attributes	0	1	4	3	8	9	9	6	3	4	3

It is evident from this analysis that 72% of those who did well in the Army had not more than four attributes, and that 68% of those who did badly in the Army had five or more attributes. The result has a high degree of statistical significance ($\chi^2 = 16$; for one degree of freedom $P < 0{\cdot}01$).

One important purpose of such an analysis is to indicate the criteria on which unsuitability for the Army may be detected before actual breakdown has occurred. The list of attributes, however, included symptoms such as hypochondriasis which if persistent would be enough to make Army duties impossible. It was therefore necessary to make a reduced list eliminating from among the ominous attributes those which could be directly and solely decisive against doing well in the Army. These were active dislike of the Army and unwillingness to resume duty, hypochondriasis, amnesia and surly paranoid attitude. Taking in each hospital 50 of the men on full duty and 50 discharged and combining them, the numbers in the reduced list were as follows:

No. of ominous attributes	0	1	2	3	4	5	6
No. of "full duty" men with that no. of attributes	21	21	20	12	12	10	4
No. of "discharged" men with that no. of attributes	8	14	17	20	13	17	11

Here the difference in distribution of the two groups is not so striking, nor does it reach such a high degree of

statistical significance, though still an adequate one ($\chi^2 = 14{\cdot}6$; for 6 degrees of freedom $P < 0{\cdot}025$). It will be seen that 74% of those on full duty have 3 or less of the ominous attributes listed in this table.

Because of these findings, at one of the hospitals the records were re-examined of those men who had been sent back to the Army in spite of their possessing six or more of the ominous attributes, and who had subsequently been discharged from the Army. In 6 instances, it was found, the psychiatrist who had been treating the patient in the neurosis centre had advised his discharge from the Army, but the military board had not agreed with this opinion and had sent the man back in a lower category. In the other instances the psychiatrist had either recommended that the man should be tried in a lower category on home service or had been influenced by the man's keenness to return to military duty. In 7 of them the fact that the man had improved rapidly while in hospital and was almost free from symptoms had led to his return, although the prognosis for military duty could be recognised as decidedly poor. On the other hand the one patient with less than two ominous attributes who had been subsequently discharged was found to have hysterical conversion symptoms which in themselves were sufficient to make military duty impossible.

* * *

It is important to recognise that the patients studied had been discharged from hospital before the procedure was introduced whereby a neurotic soldier, previously engaged in duties for which he was unfitted, could be transferred to more suitable duties on the psychiatrist's recommendation. There are grounds for believing that the results obtained since that procedure has been used are more satisfactory, and that criteria of prognosis will have changed correspondingly. It is obvious that prognosis must be influenced by the conditions under which the soldier will be working when he resumes duty on leaving hospital.

SUMMARY AND CONCLUSION

At two hospitals for the treatment of neurosis a group of soldiers who on return to the Army after treatment were still on full duty some months later were compared with a group of those who had subsequently to be discharged from the Army. The medical records of 300 soldiers (150 in each group) were investigated, and 10 features determined which occurred with significantly different frequency. There were consistent differences in the frequencies of other features, which were however, individually, not statistically significant.

Comparison of the separate data of the two hospitals confirmed this.

The traits which were found with significantly greater frequency in men who proved unsuitable for military duty were: a history of mental disturbance, including neurosis, in parents or siblings; unsatisfactory work record prior to enlistment; psychopathic traits of personality; symptoms of the present illness before enlistment; resentment or strong dislike of Army life; reluctance to return to Army duties; onset of the illness without its having been precipitated by exposure to bombardment, continuous danger, and other stresses of active service; querulous hypochondriasis; fugue or amnesia; and surly or paranoid attitude.

The fewer of these attributes a patient has the greater the likelihood of his remaining in the Army. The evidence however does not indicate that prognosis can be safely based on the number of these attributes a patient is found to possess. The intensity with which each such attribute has been exhibited, its nature, and the favourable attributes also discovered must be taken fully into account in each case.

The findings do not pay regard to the varying conditions of Army life, to which soldiers return; these also are important in determining the course of the man's illness and successful adaptation to Army requirements. The groups investigated were dealt with before a new and valuable procedure had been introduced permitting a measure of adjustment to be made on the psychiatrist's recommendation.

AUXILIARY R.A.M.C. FUNDS.—The annual meeting of members will be held at 5 P.M., on Friday, May 1, at 11, Chandos Street, London, W.1.

USE OF PHOLEDRINE AT MAJOR OPERATIONS

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PHOLEDRINE ('Veritol') is a comparatively new pressor agent which came to this country from Germany with good clinical reports in 1937. Hicks (1937) brought it to my notice, and I began a clinical study of its use during and after major general operations under all types of anæsthesia. My findings (1939, 1940) were in accord with the claims of the German authorities, and much subsequent work has confirmed the value of pholedrine, but Schoenwald, Schweitzer and Steel (1940) from animal observations reached adverse conclusions.

This article deals with the restorative action of pholedrine on the blood-pressure during and after major operations—that is, with purely clinical findings. Blood-pressure records during operations have been made since 1932; in this article the results from nearly 300 unselected charts are used.

Most of the charts have been made by Mr. Gerald Merton, Ph.D., at first with the mercury sphygnomanometer, and later with the oscillometer, which besides giving the blood-pressure gives some indication of the volume of the pulse by the amplitude of the needle oscillations. This swing at the beginning of operations is usually 25–40 dial calibrations, but after 1½–2 hours, although the pulse-rate and the blood-pressure may be around normal, the swing has often fallen 10–15 divisions; thus some indication of the output of the heart is available, an important factor in shock. Most of the charts were obtained during important operations where shock in some degree was always present. The purpose of the observations was to anticipate and prevent shock; they were in no way experimental. On many patients the readings were continued for some time after the operation and in the ward for the next few days.

At first every large fall in blood-pressure was treated in some way—e.g., ephedrine, pholedrine or inhalation of carbon dioxide—but latterly pressor agents were used only to counteract serious falls of blood-pressure and when the patient's condition caused anxiety. Where the falls could be attributed to the immediate effects of operation time was allowed for the patient's recuperative power to act before resorting to stimulants. Some of the earlier patients were given unnecessary and incorrect doses of pholedrine, which produced excessive rises in blood-pressure.

The anæsthetics used included (*a*) spinal 1 in 1500 'Percaine,' which in some instances was supplemented by gas-oxygen, open ether, gas-oxygen with cyclopropane, ether or 'Vinesthene,' or by 'Pentothal'; (*b*) general anæsthesia with gas and oxygen, gas-oxygen and ether, gas-oxygen and cyclopropane, gas-oxygen and vinesthene and open ether; (*c*) local anæsthesia, employed with increasing frequency since June, 1937, sometimes alone, or supplemented by gas-oxygen, ether, cyclopropane, pentothal or light open ether. Thus pholedrine has been tried with most anæsthetics in current use. With local anæsthesia the falls in blood-pressure have been less and the corrections required reduced. Not all of the 300 patients required a pressor drug; in fact with increasing experience stimulants have been used less and less. Several pressor agents have been used but pholedrine has been the main one since January, 1938.

Ephedrine, gr. ½–1, intramuscularly was given before spinal anæsthesia was administered. The blood-pressure charts showed that gr. 1 was the minimum dependable preoperative dose to protect an adult against a fall in blood-pressure during operations under spinal anæsthesia. During operations, ephedrine gr. ½ was injected intravenously to counteract falls under spinal anæsthesia; pholedrine ousted it because it was more consistent in effect, acted for longer periods, was effective in repeated doses and was equally potent intramuscularly.

Hypertonic saline (30%), 20–40 c.cm. intravenously, will raise the blood-pressure and improve the patient's colour, especially during operations under spinal anæsthesia (Walker 1936). It also reduces the incidence of headaches after spinal anæsthetics.

Method of administration of pholedrine.—In 1 c.cm. of pholedrine there is 0·02 g. of pholedrine sulphate. At first pholedrine was given intravenously. The result was immediate and lasted up to ½ hour; 0·2–0·25 c.cm. was found to be the useful dose, amounts above this being followed by excessive rises. Intramuscular injections of pholedrine, 0·75–1 c.cm., act in 3–5 min., restoring a fallen pressure to about the normal for 20–40 min. At the end of a long operation, when one or two administrations have already been made, 1·25–1·5 c.cm. are necessary. When the blood-pressure fall is extreme, 0·2–0·25 c.cm. intravenously plus 0·75–0·8 c.cm. intramuscularly will give an instantaneous rise lasting for 30–40 min.

Subcutaneous injections are undependable for the low systolic pressures encountered at operations, but are useful for debilitated subjects in the ward, to raise the pressure before or after operation when the levels are not as low as those found during operations.

Leptazol ('Cardiazol') was often given with the pholedrine in cases where the pulse was irregular, where the colour was poor, the patient sweating, breathing difficult or there was reason to suspect cardiac weakness. The combination exerts a stronger pressor effect than veritol alone. Leptazol alone was found to exert no pressor effect when given intravenously, intramuscularly or subcutaneously in doses up to 1 c.cm.

RESULTS

The table gives the results in 89 operations where pholedrine was given. The responses were divided into three grades. The response was called normal if it brought the systolic blood-pressure to within 25% of the preoperative level; a small response was recorded where the pressure rose to less than this, and an excessive response where it rose to over 25% above the preoperative figure. In no case was a fall in pressure noted after injection of pholedrine, but in 3 instances irregularity and occasional missed beats in the pulse were noted after its use.

Single administrations.—Of the 89 patients on whom pholedrine was used, 60 required a single dose, and of these 53 (89%) responded to within 25% of the normal systolic blood-pressure. In 6 there was an excessive rise; 2 of these were undergoing operations for herniæ under spinal anæsthesia where the operative shock was small and the patient's power of response good, so that pholedrine was not strictly necessary. This point was realised as the study proceeded. In case 35 the systolic pressure was raised from 80 to 190 mm. Hg (normal 135 mm.); on account of irregularity of the pulse leptazol 1 c.cm. was given with the pholedrine, and this case illustrates the powerful effect of the combination, especially in shocked patients. In case 38, in which the systolic pressure was raised from 80 to 200 mm. for 135 min., pholedrine 0·5 c.cm. was given intravenously as well as 0·5 c.cm. intramuscularly; this was one of the first patients to whom the drug was given by both routes, and the intravenous amount was excessive. Subsequent experience has shown that 0·2–0·25 c.cm. is the maximum useful intravenous dose, followed by 0·8–0·75 c.cm. intramuscularly. In only one case was the response small after a single dose (case 68, radical excision of carcinoma of the breast). Here the pressure was raised from 60 mm. to 95 mm. for 45 min. after pholedrine 0·5 c.cm., a dose which was too small to produce an adequate rise, but this was intentional, since to minimise bleeding from a large wound it is my practice to allow the blood-pressure to remain low.

Thus in 59 of 60 patients (98%) with low pressure during operation the normal systolic pressure was restored or exceeded after a single dose of pholedrine.

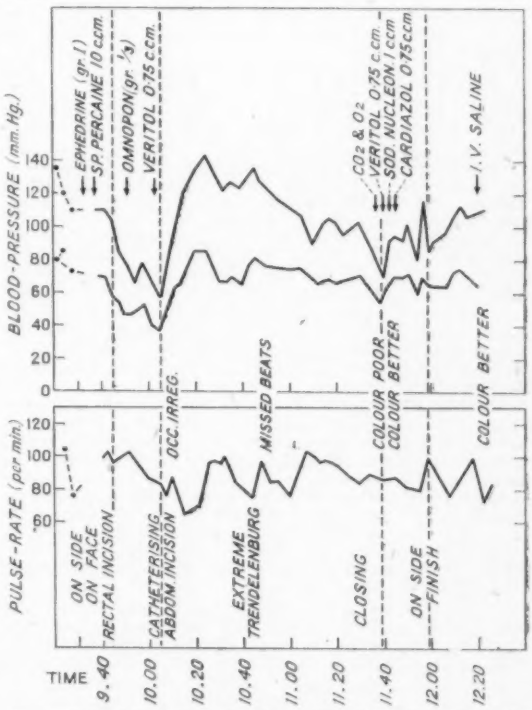
Repeated injections.—On the evidence of the blood-pressure charts and the clinical condition, repeated doses were judged necessary in 27 patients, 66 doses being given in all. In 49 (74%) the pressure was restored to within 25% of the preoperative level. There were 5 excessive responses, 3 during operations on the gall-bladder and common bile-duct and one each during partial gastrectomy (local infiltration, gas and oxygen) and pneumonectomy (spinal anæsthesia).

CASE 9.—Preoperative BP 135/95 mm. Hg. Cholecystectomy and exploration of common bile-duct under spinal percaine. Duration of operation 90 min. Systolic pressure fell to 85 mm.; pholedrine 1½ c.cm. raised it to 180 mm. for 35 min. It then fell to 70 mm.; pholedrine 1 c.cm. raised it to 105 mm. for 45 min. Another fall to 73 mm.; pholedrine 1 c.cm. raised it to 153 mm. for 45 min. After a further fall to

EFFECTS OF PHOLEDRINE IN SINGLE AND REPEATED DOSES IN 89 PATIENTS

Operations	Single dose: response				Repeated doses: response				
	Cases	Normal	Excessive	Small	Cases	Doses	Normal	Excessive	Small
Cholecystectomy and choledochostomy	15	13	2	(1*)	8	19	14	3	2
Partial gastrectomy for gastric and duodenal ulcers	12	11	1	..	2	4	3	1	..
Partial gastrectomy for carcinoma of stomach	5	5	..	..	..	..	..	..	..
Excision of colon and rectum for carcinoma	8	8	..	..	6	16	15	..	1
Radical excision of breast for carcinoma	3	2	..	1	4	11	6	..	5
Laparotomy and appendicectomy	6	5	1	..	..	..	..	..	..
Radical cure of inguinal hernia	4	2	2	..	..	..	..	..	..
Pneumonectomy	..	..	..	..	1	3	2	1	..
Block excision of malignant glands of neck	1	1	..	..	1	2	1	..	1
Cervical sympathectomy	1	1	..	..	..	..	..	..	..
Operations on kidney and bladder for stone or carcinoma	5	5	..	..	5	10	8	..	2
Total	60	53	6	1	27	65	49	5	11

* Case 12; subcutaneous administration.



Simplified version of record-chart in a man of 73 years during 2nd stage of resection of carcinoma of rectum. 'Omnopon' gr. ½, scopolamine gr. 1/150 and nikethamide ('Coramine') 0·5 c.cm. were given at 9 A.M. Spinal anæsthesia. Patient died from heart-failure four days after operation.

100 mm. pholedrine 1 c.cm. raised it to 135 mm. for 60 min. (The observations were continued in the ward after the operation.)

CASE 14.—Preoperative BP 180/115 mm. Hg. Cholecystectomy under open ether. Pholedrine 1 c.cm. raised systolic pressure from 115 to 230 mm. for 50 min. This is an exceptional response; possibly some of the injections passed into a vein.

CASE 20.—Preoperative BP 155/85 mm. Hg. Cholecystectomy under spinal percaine. After 1 c.cm. of pholedrine no change occurred for 10 min., although pholedrine intramuscularly usually acts in 3–5 min. A further 1 c.cm. was given and in 5 min. the systolic reading rose from 0 to 160 mm. and within 20 min. it had risen to 210 mm. The patient was stout and perhaps the first dose was subcutaneous and did not take effect until the second dose improved the circulation.

CASE 38.—Preoperative BP 135/90 mm. Hg. Partial gastrectomy under local and gas and oxygen. Systolic pressure fell to 80 mm.; pholedrine ½ c.cm. intramuscularly and 0·5 c.cm. intravenously raised it to 200 mm. for 30 min. Later it fell to 10 mm.; pholedrine 0·5 c.cm. intravenously raised it to 140 mm. (Excessive intravenous dose.)

CASE 73.—Preoperative BP 130/90 mm. Hg. Pneumonectomy. At start of operation systolic pressure fell to 85 and pulse was irregular. Pholedrine 1 c.cm. with leptazol 1 c.cm. raised systolic pressure to 175 mm. for 30 min. After another 20 min. it had fallen to 90 mm.; pholedrine 1 c.cm. with leptazol 1 c.cm. raised it to 115 mm. for 45 min. After 105 min. pressure was 100 mm. and pholedrine 0·25 c.cm. with leptazol 0·25 c.cm. raised it to 130 mm. for 30 min. The excessive response was, I think, due to leptazol being given with the pholedrine.

A small response in the repeated-dose series was noted in 9 patients (18%). In only one patient was there no rise. The increase was often just short of "normal" and there was clinical benefit to the patient.

CASE 8.—Preoperative BP 140/85 mm. Hg. Cholecystectomy under local anæsthesia. Duration of operation 2 hr. Systolic pressure fell to 100 mm.; pholedrine 1 c.cm. raised it to 165 mm. for 110 min., after which it fell to 65 mm. and pholedrine 1 c.cm. raised it to 90 mm. (observations were continued in ward after operation).

CASE 15.—Preoperative BP 145/90 mm. Hg. Cholecystectomy under gas, oxygen and ether. Duration of operation 1 hr. During operation systolic pressure fell to 78 mm. and pulse was irregular; pholedrine 1 c.cm. with leptazol 1 c.cm. intramuscularly raised pressure to 135 mm. for 30 min., followed by a further rise to 185 for 15 min., when it fell in 40 min. to 95 mm. Pholedrine 1 c.cm. with leptazol 1 c.cm. had no effect in 20 min. Pholedrine 1 c.cm. and leptazol 1 c.cm. were repeated, and pressure then rose to 110 mm. and slowly to 115 mm. in the next 40 min.

CASE 54.—Woman aged 77. Preoperative BP 180/100 mm. Hg. Resection of carcinoma of rectum under spinal percaine. After operation started systolic pressure fell to 80 mm. Pholedrine 0·25 c.cm. intravenously and 0·75 c.cm. intramuscularly raised it to 156 mm. for 25 min. In 35 min. it had fallen to 85 mm., but 1 c.cm. of pholedrine raised it to 130 mm. for 25 min., when it fell to 75 mm. in 30 min. Pholedrine 1 c.cm. then restored it to 130 mm. The two last rises did not reach 25% of the preoperative figure, but they brought the pressure to a satisfactory clinical level.

CASE 60.—Woman, aged 36, a fragile subject. Preoperative BP 135/85 mm. Hg. Carcinoma of breast. Radical excision under gas and oxygen. Duration of operation 80 min. After 45 min. systolic pressure fell to 0. Pholedrine 0·7 c.cm. raised it to 125 mm. for 20 min. It then fell to 105 mm. and pholedrine 0·25 c.cm. intramuscularly kept it at that figure for 30 min., when it fell to 95 mm. Pholedrine 0·5 c.cm. with leptazol 0·5 c.cm. then raised it to 110 mm. but it gradually fell to 65 mm. in the next hour. Pholedrine 1 c.cm. intramuscularly slightly raised it to 80 mm. in 20 min. Finally, pholedrine 1 c.cm. with leptazol 1 c.cm. brought it to 100 mm.

CASE 62.—Carcinoma of breast. Radical excision under gas, oxygen and ether. Preoperative BP 115/68 mm. Hg. Duration of operation 75 min. After 20 min. systolic pressure fell to 65 mm.; pholedrine 1 c.cm. raised it to 95 mm. for 15 min. Pressure then fell to 65 mm. and pholedrine 1 c.cm. raised it to 85 mm. for 45 min.

CASE 63.—Carcinoma of breast. Radical excision under gas, oxygen and ether. Preoperative BP 160/90 mm. Hg. Duration of operation 80 min. Pressure fell to 65 mm. after 30 min. Pholedrine 1 c.cm. raised it to 95 mm. for 15 min. It then fell to 65 mm. and pholedrine 1 c.cm. raised it to 85 mm. for 45 min.

CASE 64.—Radical excision of carcinoma of breast, under spinal percaine. Preoperative BP 130/90 mm. Hg. Duration of operation 65 min. Systolic pressure fell to 70 mm. before operation started. Pholedrine 0·2 c.cm. intravenously and 0·8 c.cm. intramuscularly raised it to 160 mm. in 5 min.; 20 min. later it was 70 mm. and later 0. Pholedrine 1 c.cm. intramuscularly restored it to 80 mm. for 1 hour, when observations stopped.

The modified response in these radical breast operations will be noted, the normal systolic level was seldom restored by pholedrine, but this was never pressed, because in order to minimise the bleeding the blood-pressure was allowed to remain low.

CASE 84.—Nephrectomy for massive carcinoma of kidney performed under local infiltration and open ether. Preoperative BP 130/80 mm. Hg. Duration of operation 2 hr. After 75 min. systolic pressure fell to 65 mm.; pholedrine 1 c.cm. raised it to 85 mm. for 30 min., when it fell again and a further 1 c.cm. of pholedrine only raised it to 90 mm.

CASE 89.—Age 70. Preoperative BP 150/90 mm. Hg. Malignant glands of neck. Excision under gas, oxygen and ether. Systolic pressure fell to 90 mm.; pholedrine 1 c.cm. with leptazol 1 c.cm. raised it to 110 mm., but later it receded to 80 mm.; pholedrine 1 c.cm. with leptazol 1 c.cm. raised it to 160 mm.

INSTRUCTIVE CASES

The following case illustrates the effective clinical dose of pholedrine.

CASE 86.—Woman, aged 41. Preoperative systolic pressure 120 mm. Hg. During nephrectomy, systolic pressure fell to 80 mm. and remained so for 20 min.; there was thus no natural tendency to recover. Every 5 min. pholedrine 0·25 c.cm. was given intramuscularly; there was no response until the fourth injection, when the systolic reading rose from 80 to 120 mm. and remained so for 135 min.

The next two show that pholedrine by mouth may be ineffective in the presence of shock, but produces good results when given intramuscularly, and that pholedrine is ineffective when given subcutaneously during operation.

CASE 10.—Cholecystectomy under spinal percaine. Preoperative BP 130/85 mm. Hg. In the ward 1 hr. after operation systolic pressure was 95 mm. Pholedrine 1 c.cm. was given by mouth but no effect was detected in 18 min. Pholedrine 0·75 c.cm. given intramuscularly raised the pressure to 115 mm. immediately.

CASE 12.—Preoperative BP 155/90 mm. Hg. Cholecystectomy under local infiltration and open ether. Systolic pressure fell during operation to 100 mm.; pholedrine 1 c.cm. subcutaneously had no effect in 20 min.

SUMMARY

An analysis is made of the blood-pressure charts of 89 patients who received the pressor drug pholedrine during major surgical operations.

The anæsthetics given included all those now in common use, whether general, spinal or local.

The effective dose of pholedrine was found to be: 0·2–0·25 c.cm. intravenously; 1 c.cm. intramuscularly; or 0·2–0·25 c.cm. intravenously plus 0·75–0·8 c.cm. intramuscularly.

Pholedrine given in these amounts as a single dose raised a low blood-pressure to within 25% of the normal in 89% of patients.

Pholedrine given in repeated doses (up to five) still raised the pressure to normal or over in 82% of cases. A useful rise was noted in almost all subjects, when the correct dose was used. If the operation is long or shock is appreciable the intramuscular dose may be increased to 1·5 c.cm.

In 126 injections of pholedrine no fall in pressure was observed.

Excessive rises in pressure after pholedrine are avoided by correct assessment of the patient's condition and accurate estimation of the dose. The patient's own recuperative power must be reckoned with and given time to act.

Variability of the pulse after pholedrine was noted

by a trained observer three times in 126 administrations, but otherwise no ill effects were observed.

Leptazol was found to be ineffective by itself but when combined with pholedrine had a powerful pressor effect.

I am indebted to Dr. Gerald Merton for making observations at operations between 1935 and 1939; war-time blood-transfusion work prevents him joining in this paper.

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ANEURINE AND CARBOHYDRATE METABOLISM IN DIABETICS

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THE action of aneurine (vitamin B_1) has been linked up with carbohydrate metabolism by the identification of cocarboxylase as aneurine pyrophosphate (Lohmann and Schuster 1937). This substance is believed to exert its catalytic influence in the pyruvic-acid stage in the breakdown of carbohydrates (Peters 1940). The phosphorylation of both hexosemonophosphate and glucose itself during oxidation of pyruvic acid may be another important factor relating aneurine to carbohydrate metabolism (Ochoa 1940). Also aneurine may be involved in Krebs's C_4 acid cycle and in the carboxylation of certain carbohydrate metabolites (Krebs 1941).

Although these findings prove the close connexion of aneurine with carbohydrate metabolism, the question whether aneurine influences the level of blood-sugar in animals and particularly in man is still controversial. Some direct influence on the blood-sugar might be expected, but it is doubtful whether under physiological conditions such action will be effective enough to overpower the regulatory mechanism maintaining the blood-sugar level. This is of practical importance, because claims have been made that vitamin B_1 exerts a beneficial effect in diabetic patients, both on blood-sugar and on the response to insulin (Desgrez et al. 1923, Lewinson 1937, Gottlebe 1938, Beckert 1938).

Since Funk and Schönborn (1914) first reported that hyperglycæmia is produced in pigeons kept on a vitamin-B_1 deficient diet, various others have reported similar although rather variable results (Randoin and Lelesz 1926, Labbé et al. 1933). In vitamin-B_1 deficient rats, however, Eggleton and Gross (1925), Bell (1931), Kodicek and Joachim (1935) did not find any significant rise of blood-sugar, and equally negative results were obtained by Stucky and Rose (1929) in vitamin-B_1 deficient dogs. Lepkowsky and his colleagues (1930) found a disturbance in sugar tolerance in rats with vitamin-B_1 deficiency, but it was late in appearing and was possibly of a secondary nature. The fasting blood-sugar levels of deficient rats remained within normal limits. On the other hand, Lajos (1936) reported a rise in the fasting blood-sugar in vitamin-B_1 deficient rats, and Usuki (1936) in deficient dogs, especially in the last stages of deficiency. The hyperglycæmia returned rapidly to normal after administration of vitamin B_1. The influence of vitamin B_1 on the blood-sugar of normal dogs and rabbits was studied by Tislowitz (1937). He found on administration of aneurine an increased sugar tolerance and an increased sensitivity of the normal dogs to insulin. Also Burke and McIntyre (1938, 1939) state that the presence of aneurine in a diet otherwise deficient in vitamin-B complex increased the sensitivity of the rat to insulin. But according to later experiments by Martin (1937) aneurine was ineffective in curing the insulin-resistant hyperglycæmia of depancreatised dogs, which had been kept on a vitamin-B deficient diet for 6–7 weeks and treated with insulin. A mixture of aneurine and riboflavin promptly corrected the disturbance in the sugar metabolism. If these findings could be confirmed, they would show the importance of the vitamin-B complex rather than of aneurine only.

The position is equally confusing with regard to human blood-sugar levels and the response towards insulin, especially in diabetic patients. Vorhaus and his colleagues (1935), Lewinson (1937) Gottlebe (1938), Mosonyi and Aszodi (1938) reported that aneurine slightly lowered the blood-sugar in diabetics, and increased both their sugar-tolerance and their sensitivity to insulin. Many workers, however, have found no such favourable influence of aneurine on blood-sugar. Priesel and Wagner (1930), Jonata (1931), Drigalski (1935), Schröder (1937), Smith and Mason of the Mayo Clinic (1940) and Joslin (1940) reported negative results. Owens and his colleagues (1940) could not reduce the insulin requirement of well-controlled diabetics, even when large amounts of aneurine and riboflavin were administered. Serious criticisms have also been raised in several monographs (Harris 1938, Williams and Spies 1938, Joslin 1940).

TABLE I—BLOOD-SUGAR CURVES OF DIABETICS AFTER INTRAVENOUS INJECTION OF 2 MG. OF ANEURINE

Patient	Blood-sugar (mg. per 100 c.cm.)				Patient	Blood-sugar (mg. per 100 c.cm.)			
	Fasting	After injection of 2 mg. aneurine				Fasting	After injection of 2 mg. aneurine		
		30 min.	60 min.	120 min.			30 min.	60 min.	120 min.
1	318	280	208	268	15	125	130	175	120
2	208	223	173	208	16	194	173	218	218
3	138	125	120	125	17	181	194	125	208
4	228	164	194	228	18	144	106	245	200
5	163	126	83	200	19	228	200	218	245
6	106	173	194	186	20	184	200	262	228
7	164	154	163	182					
8	144	75	154	144	Mean	194·7	188·3	205·6	209·9
9	126	126	144	134					
10	275	235	295	344					
11	194	235	218	200	Differences from mean of fasting level		− 6·4	+ 10·9	+ 15·2
12	272	294	314	236					
13	173	270	330	320					
14	328	282	278	253					

Variance ratio $= \frac{v_1}{v_2} = \frac{1958{\cdot}6}{1289{\cdot}9} = 1{\cdot}5184$ z $= \frac{1}{2}\log_e \frac{v_1}{v_2} = 0{\cdot}209$

TABLE IV—DIFFERENCES BETWEEN VALUES IN TABLES II AND III

Patient	Blood-sugar (Δ)				Patient	Blood-sugar (Δ)			
	Fasting	30 min.	60 min.	120 min.		Fasting	30 min.	60 min.	120 min.
21	− 10	− 28	+ 18	− 57	28	− 63	0	− 20	− 38
22	0	− 20	+ 37	+ 38	29	0	− 18	− 71	− 10
23	+ 30	+ 46	+ 10	+ 8	30	− 34	− 27	− 10	+ 31
24	+ 62	− 18	+ 38	+ 68	31	+ 63	+ 66	+135	+ 99
25	0	− 10	− 35	−130	32	+127	+ 70	+ 77	+ 14
26	− 29	− 94	+ 10	− 37					
27	0	+ 78	− 89	−174	Mean	+ 12·2	+ 3·8	8·3	− 15·7

Mean difference of 48 readings $= \frac{\Sigma\Delta}{48} = + 2{\cdot}2$.
Standard error of the mean difference $= 10{\cdot}4$.
" " " " " of 12 patients $= 20{\cdot}8$.

TABLE II—BLOOD-SUGAR CURVES OF DIABETICS TREATED WITH 20 I.U. OF INSULIN SUBCUTANEOUSLY: CONTROLS

TABLE III—BLOOD-SUGAR CURVES OF DIABETICS FROM TABLE II TREATED WITH 20 I.U. INSULIN AND 2 MG. ANEURINE

Patient	Blood-sugar (mg. per 100 c.cm.)				Blood-sugar (mg. per 100 c.cm.)			
	Fasting	After injection of 20 I.U. insulin			Fasting	After injections of insulin and aneurine		
		30 min.	60 min.	120 min.		30 min.	60 min.	120 min.
21	218	228	126	163	208	200	144	106
22	173	200	126	97	173	180	163	135
23	300	268	235	200	330	314	245	208
24	200	200	106	106	262	182	144	173
25	308	245	235	312	308	235	200	182
26	274	312	218	245	245	218	228	208
27	312	228	280	280	213	306	191	106
28	245	163	163	135	182	163	143	97
29	314	280	262	154	314	262	191	144
30	314	262	218	85	280	235	208	116
31	182	154	75	55	245	220	210	154
32	135	92	85	50	262	162	162	64
Mean	247·9	219·3	177·4	156·8	260·1	223·1	187·4	141·1

In the light of such contradictory evidence it seemed important to investigate under well-controlled conditions the effect of aneurine on the blood-sugar of diabetics, with and without the addition of insulin, and to analyse statistically the blood-sugar curves.

EXPERIMENTAL

A series of 32 middle-aged patients suffering from mild diabetes were chosen for the tests. They were all on a standard Joslin's diet, most of them without previous insulin treatment. These patients were divided into two groups, of 20 and 12 respectively. In the first group the effect of aneurine was examined on the fasting level of blood-sugar, and in the second group the combined action of aneurine and insulin was investigated. The blood-sugar determinations were performed by the method of Hagedorn and Jensen (1923). The experiments were always timed from 8 A.M. to 10 A.M.

Effect of aneurine on blood-sugar in diabetics.—The values for the fasting blood-sugar in 20 diabetics were first ascertained, and then 2 mg. of aneurine ('Bernerva,' Roche) was injected intravenously. Blood samples were analysed 30, 60 and 120 min. after the injection, while the patients remained without food (table I). The fasting levels of blood-sugar of normals and diabetics without any treatment do not change appreciably during such a short experimental period. If no significant difference in the individual means of the time curve were observed after injection of aneurine, it could be concluded that this was sufficient proof of the inefficiency of aneurine in decreasing blood-sugar in diabetics, at least in a short-time experiment.

The individual curves of the patients varied greatly both in shape and in fasting values. Fisher's (1938) analysis of variance was found to be the most suitable way of treating these results statistically; the essential data for these calculations are given in table I. The mean square between times ($v_1 = 1958{\cdot}6$) and the mean square for error ($v_2 = 1289{\cdot}9$) provide a basis on which to evaluate whether the changes of the blood-sugar values of the time curve (v_1) are significantly different from the error (v_2) of the experiment. The tabulated 5 pt. value of z for this particular case is approximately 0·5 (for degrees of freedom 3 and 57), which is greater than the value obtained from the analysis of variance (z = 0·209). We can therefore conclude that the difference between times is not significant and that the variations of the blood-sugar are within the error of observation. As a check on these statistical calculations the standard error of the mean for 20 patients was calculated ($\pm$ 8·03). When compared with the observed differences between two means—namely, the mean of the initial blood-sugar values with the other means of the time curve (see table I)—the difference was not significant, being smaller than twice the standard error of the mean.

Combined effect of aneurine and insulin on blood-sugar level.—In the second group the fasting blood-sugar of 12 patients was examined; then their response to 20 I.U. of insulin was determined during the next 2 hours (table II). The third day after these control tests a similar experiment was performed with the same patients, but an intravenous injection of 2 mg. of aneurine was combined with a subcutaneous dose of 20 I.U. of insulin (table III). The differences between the two sets of results were calculated and the main difference statistically analysed, the variance technique being employed as in the previous section. Table IV shows that the mean difference between the blood-sugars with and without aneurine does not differ significantly from zero in any of the four groups or for the data as a whole, for no mean is as much as twice its standard error.

DISCUSSION

It is evident from the results that aneurine either alone or in combination with insulin does not exert any influence on the blood-sugar of diabetic patients, at least in such a short-time experiment. That more prolonged administration of aneurine is also ineffective is suggested by the fact that 10 mg. given daily for 4 weeks to 2 diabetics did not improve their sugar-tolerance or insulin requirement. These results do not support the view that there is any direct interconnexion between the disease and aneurine requirements, and they do not justify the use of aneurine in diabetes for the purpose of increasing the sugar-tolerance. On the other hand, diabetic diets may be often low in vitamin B_1, so that a partial deficiency of vitamin B_1 which would require treatment with aneurine is likely to be an incidental accompaniment of diabetes.

SUMMARY

The effect of aneurine on the blood-sugar was studied in 32 diabetics, and the results statistically evaluated.

Aneurine does not affect the fasting blood-sugar values or increase the response to insulin of diabetic patients.

These findings suggest that the use of aneurine to increase the sugar-tolerance in diabetes is not justified.

I wish to thank Dr. J. O. Irwin for his advice on the statistical calculations, and Dr. L. J. Harris for his interest and criticism. Roche Products Ltd. generously supplied pure vitamin B_1.

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NOTES ON TRICHLORETHYLENE ANÆSTHESIA

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IT was originally intended to submit a large number of cases in which trichlorethylene ('Trilene' ICI) had been used as an anæsthetic to detailed analysis, but circumstances have rendered this impossible. The administration of this drug to some fifty patients has, however, led to certain conclusions which may be worthy of record. These cases range from laparotomy to dilatation and curettage and provide a fair cross-section of surgical cases. Ages ranged from 5 to 68 years. Trilene is a purified form of trichlorethylene to which a small quantity of a stabilising agent has been added. Its properties have been reviewed by Hewer and Hadfield.[1] It is non-explosive, easy to administer, and in my experience safe. Premedication used was 'Omnopon' gr. 1/3 and scopolamine gr. 1/150 except for children, and the apparatus a standard Boyle's machine with the trilene used in the chloroform bottle. Induction was in all cases smooth and easy, and coughing and struggling conspicuously absent. Relaxation was good except in one case where ether had to be used in addition. A point worth noting is that respiration becomes very shallow or ceases if the trilene is pushed too rapidly, but has soon started again after administration of CO_2 and oxygen. This respiratory depression may possibly

1. Hewer, C. L. and Hadfield, C. F. *Brit. med. J.* 1941, ii, 924.

have been due partially to the premedication. Blood-pressure usually remains unaltered or shows a slight tendency to rise. The pulse on the whole is not affected in rate or quality. At the outset a few cases were noted where the pulse became slow and grossly irregular but this was attributed to some degree of anoxæmia and has not been seen since it was realised that a considerably greater percentage of oxygen is necessary than when using ether. This seems to be an important point.

Postoperative complications were much fewer than when ether was used. Vomiting was rare and no chest complication was seen. Restlessness was diminished, and ward sisters were enthusiastic advocates of the drug.

ENCEPHALOPATHIA ARTERIOLO-SCLEROTICA BASALIS LETHARGICA

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SOMNOLENCE or lethargy from brain disease, when it occurs as a main symptom without gross compression (large tumours, abscesses, hæmorrhages, internal hydrocephalus), is often associated with paralysis of eye muscles and ptosis. This favours the view that the oculomotor nerve nuclei are intimately connected with the sleep centre, as Mauthner suggested in 1890. A striking example of this association is the encephalopathia first described by Wernicke in 1881, and named by him polioencephalitis acuta hæmorrhagica superior; this condition is now supposed to be due to deficiency of vitamin B_1 and to various toxic and other conditions (Campbell and Biggart 1939). Owing to the predominance of lethargy in the clinical picture Economo named the epidemic encephalitis, which he described in 1917, "encephalitis lethargica." The encephalopathy in our case clinically so closely resembled encephalitis lethargica that it might be called pseudo-encephalitis lethargica, but we suggest that a more suitable term is encephalopathia arteriolosclerotica basalis lethargica.

CASE-HISTORY

A married Englishwoman, aged 63, was admitted unconscious on Feb. 6, 1941, having collapsed in the street after ailing for a few days with headache and tiredness. According to her daughter she had been "knocked about" in an Anderson shelter during two or three air-raids in September, 1940. Otherwise there was nothing special in her past history. She had occasionally taken alcohol in moderation. In the hospital she was somewhat restless, somnolent, breathing normally. She was small and thin and her skin was somewhat atrophic. Temperature 97° F.; pulse-rate 72. Brachial blood-pressure, 135/85 mm. Hg. Nothing abnormal on examination of heart, lungs and abdomen; no enlargement of liver or spleen. Pupils unequal, right larger than left; the left reacted well, the right sluggishly. Knee-jerks present on both sides. No plantar reflex obtained. Some cutaneous hyperæsthesia. Urine: specific gravity 1024, acid, trace of albumin, no sugar, a few leucocytes and calcium oxalate crystals in the centrifuged deposit. Blood Wassermann reaction negative. Blood-count on Feb. 18: red cells 6,100,000; Hb. 110%; colour-index 0·9; white cells 6800, polymorphs 69%, lymphocytes 21%; monocytes 4%, eosinophils 6%).

On Feb. 20 she was still lethargic, but she could sometimes be roused to answer questions and could be fed with a spoon, though insufficiently. The temperature and respiration were normal, though during the first week in hospital the temperature had been slightly raised (never above 101·4° F.) and the pulse-rate somewhat rapid. There was slight but definite ptosis on the right side. The right eye appeared to diverge slightly to the right, as if from paresis of the internal rectus oculi. Ophthalmoscopy by Dr. Charles Markus revealed nothing abnormal in either fundus; there was no cataract. Lumbar puncture was impossible owing to kyphoscoliosis.

The lethargy deepened and early in March no answer could be obtained to questions. She could not take food. The ptosis on the right side increased; the right pupil was larger and reacted sluggishly and afterwards not at all, whereas the left pupil reacted promptly to light. Treatment was by hexamine-caffein injections and (on account of the dehydration) by subcutaneous infusions of hypertonic saline. On March 8 the temperature in the morning was 104° F. and there were pneumonic signs on the left side; breathing was difficult. She died at midday.

Post-mortem examination of the head only was permitted. The brain weighed 1265 g.; its surface was very congested; there was no internal hydrocephalus. The pituitary gland appeared macroscopically normal. Dr. J. G. Greenfield gave the following report on the brain: Macroscopically a small hæmorrhage with surrounding softening is seen in the centre of the right optic thalamus. Microscopically this softening extends outwards between the red nucleus and the superior nucleus of the thalamus from the wall of the ventricle for about two-thirds of the width of the thalamus. There are also several small old softenings in the right lenticular nucleus. On the left side there is a smaller focus of softening on the ventricular surface of the thalamus just in front of the posterior commissure. This is not visible macroscopically. It forms a semicircular area about 1 cm. long in the antero-posterior direction, extending about 6 mm. outwards into the thalamus. No other foci of softening found. The cortex in all areas examined, the brain-stem and cerebellum are microscopically normal, except for vascular congestion.

Dr. Greenfield, on examination of his sections again, wrote that he thought there was enough thickening of the small arterioles to account for the softenings that were present. There was no softening or other abnormality round the aqueduct in the upper end of the midbrain, nor was there any evidence of capillary and endothelial hyperplasia such as one sees in Wernicke's encephalopathy. He added: "I should therefore class the case as one of cerebral arterial disease of unusual localisation."

DISCUSSION

The predominant symptoms of the case—lethargy, oculomotor palsy with ptosis—resembled those of acute encephalitis lethargica, but the post-mortem findings show that these symptoms were really due to an arteriolosclerotic change in the basal ganglia of the brain, with resulting areas of ischæmia and hæmorrhage. There was nothing to suggest a toxic or infectious ætiology; blood diseases, trauma, carbon monoxide poisoning, alcoholism and burns could be excluded. As Dr. Greenfield pointed out, there was no softening or other abnormality round the aqueduct in the upper part of the mid-brain, nor was there any evidence of capillary and endothelial hyperplasia such as is met with in Wernicke's encephalopathia. For our case and similar ones we think we are justified in suggesting the use of the term Encephalopathia arteriolosclerotica basalis lethargica. It is a purely descriptive term, taken partly from the morbid histology and partly from the clinical aspect of the disease. If preferred, instead of the clinical epithet "lethargica," the pathological epithets "ischæmica et microhæmorrhagica" might be substituted.

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FOOD UNDER FIVE

BETWEEN the ages of one and five the human young should properly take a keen interest in food. Unfortunately he does not conscientiously seek what he may devour: he devours what he can get. With a little tact, however, the two can be made to coincide, and in order to help those who have charge of young children the Ministry of Health has prepared a memorandum ("The Feeding of Children from One to Five Years." H.M. Stationery Office. 4*d*.) in which such tactful feeding is discussed. Suggested menus for 22 days do not overlook war-time handicaps, but give due prominence to salads, vegetables and milk. Those under five like puddings too, and puddings are usual as a second course for the midday dinner, the first course being fish, stews, cheese or cheese dishes, Scotch broth or vegetable soup, bacon, stoved potatoes or sea pie. Recipes for the suggested dishes fill several inviting pages. A Medical Research Council note on vitamins and cooking appears as an appendix.

Reviews of Books

Four Treatises by Paracelsus

Editor: HENRY E. SIGERIST. Baltimore: Johns Hopkins Press. Pp. 256. $3.

MOST men have been content to accept the verdict of his own generation on Theophrastus von Hohenheim, called Paracelsus—that he was an itinerant empirical physician, with a practical knowledge of pharmaceutics unusual at that time, and imbued with a fantastic and mystical philosophy. Bacon's condemnation of him in the "Novum Organon" contributed largely to the low esteem in which he has always been held in England, but in his own country he never lacked disciples. Now, under the editorship of Professor Sigerist, himself one of the translators, four competent and erudite scholars of the history of the period have translated some of the treatises of Paracelsus into English. These works did not find a publisher during his life, probably owing to opposition from the orthodox medical hierarchy whom he so bitterly attacked. Paracelsus died, still vigorous in his reforming zeal, still inveighing against authority, in his forty-eighth year; and twenty years later his treatises began to appear in print, thanks to the ardour of his disciples. But it is only in our own time that his importance as a physician has been recognised; his mystical and often fantastic philosophy obscured his share in the rebirth of scientific investigation during the 16th century. Though he was a rebel to the accepted medical doctrines of his time and became a ruthless and often coarse controversialist, these treatises throw new light on his personality. He held the true physician to be a man who saw things for himself, putting no trust in traditional lore. Long before experimental medicine, before even the researches of Vesalius, he insisted on the importance of actual contact with the diseases to which the bodies and minds of men were subject. He dismissed tradition and book-learning as false and deceitful guides. Observation, which he called experience, was to him the true road to skill in medicine; traditional lore led only to pretentiousness, covetousness and rascality. Of his originality and his powers of accurate observation there can be no question. He wrote the first treatise ever published on occupational disease—the ailments of miners. He described accurately many of the symptoms of acute and chronic arsenical and mercurial poisoning; he wrote a clear account of some mental and (as we should say) psychological states. He recognised the hysterical element in chorea major, and gave sensible directions for checking mass suggestion. "I write of the crazy dance which the common man calls St. Vitus' dance, also of those who kill themselves, also of false maladies which befall through sorcery, as well as of people possessed." His somewhat barbarous German—he never used Latin, the language of scholars at that time—must have presented difficulties to the student for he was constantly inventing new names and new methods. He triumphantly admits as much; he cannot avoid inventing terms, since he is describing what the medical hierarchy has hitherto ignored. It is scarcely strange that a combative self-reliant, intensely observant man should have made enemies of the orthodox, that "self-schooled self-scanned, self-honoured," he should have walked on earth unguessed at. He founded no school of medical thought, he was in fact an empiric; he made no great contribution to knowledge, but his ideals have survived. He takes his place among the physicians who prepared the way for the great awakening of the next two centuries.

Diseases of the Eye

(2nd ed.) *Text Book for Students and Practitioners.* EUGENE WOLFF, M.B. Lond., F.R.C.S. London: Cassell. Pp. 222. 21*s*.

A USEFUL chapter on eye-bandaging and nursing has been added; otherwise this manual retains the good features which made its predecessor a success. The strong points are clarity and simplicity of both text and illustrations; and the drawings of anatomical dissections are specially good. For the student or general practitioner wanting a general survey of ophthalmology the book is unequalled at present, although one or two points call for criticism—notably the chapter on albuminuric retinitis. Surely the time has now come to class this condition with hypertensive changes in the retina, for it is not inflammatory and albuminuria is not necessarily present. Malignant hypertension is given three lines under a separate heading, suggesting that it is a thing apart. The pathology of detached retina is clearly set out, but it should be impressed upon the reader that the first thing to do on diagnosing the condition, and before operation is undertaken, is to put the patient at rest in the position which prevents the detachment from spreading. In fig. 5 the light might have been shown focused on the eye from the nasal side, since this makes for ease of examination. Mr. Wolff is a pathologist of repute, as well as an ophthalmic surgeon, and his descriptions of morbid processes maintain the standard we have come to expect from him.

Text-book of Pathology

(5th ed.) Sir ROBERT MUIR, M.D. Edin., F.R.S. London: Edward Arnold. Pp. 991. 35*s*.

THIS new edition contains much fresh material, many new photomicrographs, a remodelling of some of the sections and three pages less than the previous edition. Most of the chief advances in pathology during the last five years are now included. The relation of jaundice to coagulation of the blood, regional ileitis and Sheehan's work on Simmonds's disease are among the newer topics discussed with characteristic caution and judgment. The author again stresses that the main function of the teacher of pathology is to explain general principles and the mechanism of pathological processes. Readers will feel the lack of a bibliography: the modern student wisely prefers to study rather than to be taught. It is superfluous to commend a book which has served generations of Scottish students.

Trauma and Disease

(2nd ed.) Editors: LEOPOLD BRAHDY, M.D., SAMUEL KAHN, M.D. London: Henry Kimpton. Pp. 655. 35*s*.

IN England a workman has only to establish precipitation, acceleration or aggravation by injury of a former disease and his disability is then treated in law as entirely due to his injury. In some American states, however, it is necessary in law to determine what proportion of incapacity was inevitable from the disease and what proportion was due to the acceleration or aggravation by the injury. American doctors have thus been stimulated to consider very closely the relationship of injury to disease. In a typical case a man of 36 crushed his left index finger in a cash register; within a week the index and third fingers of the hand became cold, pale and ulcerated, and disability was long and serious. The diagnosis was established as Buerger's disease, becoming manifest after the injury; but though this condition cannot be caused by trauma, trauma can aggravate it, as the case shows. The book, then, sets out to evaluate the rôle of trauma in the development and aggravation of disease; 24 contributors are responsible for the text, 18 of them physicians, and they have completed their task well, drawing on their wide clinical experience and reviewing much of the continental and American published work. The book does not pretend to be the last word on the subject: it has been written to stimulate further observation and discussion. Perhaps a young traumatologist may be somewhat depressed, in reading this book, to learn the full extent of his chosen clinical field, but experienced physicians and surgeons will welcome the solid material it offers.

Aids to Obstetrics

(11th ed.) LESLIE WILLIAMS, M.D., M.S. Lond., F.R.C.S., F.R.C.O.G. London: Baillière, Tindall and Cox. Pp. 238. 4*s*.

THIS latest edition of an old and trusty friend has been modernised and largely amended to bring it up to date. In a small space is compactly crammed almost all that a student on the eve of his finals will need to know, and the volume being a small one can be slipped into a pocket, ready to improve a few spare moments in bus or train. It was never intended to be a book of reference nor to supplement one, and if this is always borne in mind it is probably one of the best of this series of "Aids." The subject matter is concise and the clear-cut dogmatic style will be a relief to the confused student who has found himself non-plussed by the controversies in other textbooks. Mr. Williams, being an examiner of considerable experience, has known exactly what to include in the text for the man who must answer questions at an obstetric viva. Illustrations are few but sufficient, and the teaching represents the best in conservative obstetrics.

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THE LANCET

LONDON: SATURDAY, APRIL 25, 1942

MALARIA AND INVASION

On another page we review the report of the India branch of the Ross Institute which reflects the highest credit on the directors, managers and staffs of the tea and other industries which support the branch and its work. Not least does it reflect credit on Dr. G. C. Ramsay, his European and Indian colleagues, and the large staff of laboratory and field technicians. In many parts of India the prevention of malaria has advanced so far that it could not conceivably ever be abandoned by the governments or by the industries it has benefited. It shows what coöperation between Europeans and India can achieve; a noble gift from Ronald Ross, by race a European, by birth an Indian. But with a barbarian army on the threshold we are bound to consider how invasion might reactivate the malaria problem. In much of Assam, particularly along the foot of the Himalayas, malaria and blackwater fever have been a scourge not less severe than in West Africa. The bed of this great valley is flat. The melting snows of Tibet rush down through the Himalayas into the Brahmapootra, a river 5 to 7 miles wide, and fill it to overflowing. The monsoon rains add their quota, some 100 inches in six months, and the Assam valley becomes almost a lake during the malaria season. Nevertheless, as Sir Malcolm Watson has pointed out, the flooded areas are practically free from malaria. Ramsay proved that here malaria was carried almost exclusively by *Anopheles minimus*, a mosquito which lives in grassy sunlit streams and clear water wells, but not in shade. Ramsay also showed that the mosquito was not found in jungle, but comes in when jungle is cleared. The artificial shade of a duranta hedge over a stream is thus an effective anti-malaria measure; there are thousands of miles of such hedge in India, and unless the Japanese deliberately destroyed the shade, invasion would not increase the malaria. In other parts of Assam where control depends on oiling or flushing the danger would be greater. Fortunately the defenders will have the services of medical men completely conversant with malaria control. Bengal is largely the delta of the Ganges and the Brahmapootra, as Holland and Belgium are the delta of the Rhine. The Dutch made their land by reclaiming it from the sea, and the more embanked the freer it is from malaria. Bengal has been embanked to prevent flooding, from the rivers by the British, from the sea by the Bengalese. Unfortunately under tropical conditions both forms of embankment have produced malaria so intense that huge areas have been depopulated and abandoned to the jungle and the leopard. Eastern Bengal with fewer embankments enjoys vastly greater freedom from malaria. It was C. A. Bentley who most fully realised the risk of embankments and strove to get gates opened through them, in order to flush the land and replenish the dried-up rivers. A "scorched earth" policy, if the name can be misapplied to cutting embankments and flooding land, might destroy many lives by drowning but perhaps fewer than have fallen to malaria. Many of the rivers might find new courses, changing the face of the land and the ways of the people; the change might be for the good of the soil and the welfare of the people.

PROGRESS IN BURN THERAPY

In the whole of the last war The Lancet published but one original article on burns—that by Wakeley in 1918 on skin-grafting. It is the modern methods of warfare, and especially of air-warfare, which as Vaughan Hudson[1] puts it have raised burns from small to large type. This time the technique of treatment has evolved rapidly under a storm of controversy, and we have seen the establishment of burns units, changes in the design of aircraft for the protection and easier escape of the crews, the adoption of effective and comfortable anti-flash outfits for naval gun-crews, and important EMS directions for first-aid and local treatment of burns, besides great additions to our knowledge of their biochemistry. The first and most important problem is still the saving of life, and here the use of plasma is one of the outstanding advances of the war, making it possible to save life when up to two-thirds of the body-surface is burnt. Large amounts of plasma may be needed, for not only is there external serum loss but still larger quantities may be lost from the circulation by accumulation in the burnt tissues—thus a second-degree burn from the knee downwards may gather 3 pints of extra fluid in that area. According to Bettman[2] 40% of the total fluid shift takes place in the first hour, and 60% of the deaths occur in the first 24 hours. Early and rapid restoration of the fluid balance is therefore required. The concentration of hæmoglobin is the most useful way of following the restoration of blood-volume, but it is not an absolute guide. Wolfe and Clegg,[3] for example, found that a burnt patient with hæmoglobin of 162%, who according to Black's method of calculation required 1900 c.cm. of plasma, did not regain his normal hæmoglobin percentage until he had had 4450 c.cm. over three days. They also observed that when the plasma had been given œdema almost disappeared within 12 hours, and since for burns of the hands and face absorption of œdema is particularly important it may be advisable in such cases to give serum or plasma even when the general condition does not seem to demand it. Others have reduced local œdema within a few hours by giving concentrated serum, though they have not yet published their results. It is important, too, to keep up the administration of plasma or serum for some days, especially when sepsis supervenes and there are large discharging areas. Estimation of blood protein is apparently not a reliable guide to serum needs in these cases.

Views differ about the importance of checking external fluid loss by sealing the surface with coagulants. Wallace[4] says that from an untreated second-degree burn involving a sixth of the body surface a man may lose 3½ litres of serum out of a total blood-volume of 5 litres within 24 hours, and no-one will deny the fall in mortality after Davidson introduced tannic acid in 1925. Yet in Canada and the United States no such significance is attached to external fluid loss, and severe cases are treated in total

1. At the meeting of the Medical Society of London on March 23.
2. Bettman, A. G. *J. Amer. med. Ass.* 1942, **118**, 344.
3. Wolfe, H. R. I. and Clegg, H. W. *Lancet*, 1942, i, 191.
4. Wallace, A. B. Oxford War Manual, 1914, p. 15.

saline baths. BERMAN[5] has supported this view by demonstrating that severely burnt guineapigs recover if immersed in water, whether it be distilled, saline or tannic. Over here some form of tanning is still preferred, for the total bath requires much skilled nursing and the dangers of subsequent sepsis are considerable. Besides sealing fluid loss, tannic acid probably affects the absorption of toxic products. An immediate tan with 10% silver nitrate and 5% tannic acid is becoming popular because it produces a rapid coagulum and avoids messy spraying and overheating. As MEDAWAR[6] points out, this is not tanning but silver-plating, a quick impermeable surface seal being produced by the precipitation of metallic silver. WAKELEY has obtained equally good results with gentian violet (triple dye), which has the advantage of simplicity but the disadvantage of requiring repeated application. When he introduced tannic-acid treatment DAVIDSON also introduced the principle of cleansing the burn and especially the surrounding areas from which infection comes. This may have been the main factor in reducing mortality, though advocates of the Bunyan-Stannard technique have shown how, by open methods, preliminary cleansing can be dispensed with. Nevertheless, to treat a burn without cleansing is to face inevitable infection, despite any form of antiseptic irrigation. There must be cases where early cleansing is not possible or desirable, and here the Bunyan-Stannard methods come into their own. Recently tanned areas should not be left to wallow amidst blankets teeming in streptococci and other organisms; they should be dusted with sulphanilamide, covered with gauze and lightly splinted to rest the part. Elevation of burnt limbs is essential for promoting drainage through the lymphatic system. In slighter lesions, where there is no fluid loss, simple cleansing, a suitable sulphonamide application and a non-adhesive sterile dressing give satisfactory results.

Nine-tenths of burns are superficial, and we must not let the other tenth cloud our treatment of all cases. Whatever we do some of these hands and faces desperately burnt by petrol and oil cannot recover. The scorched hands have been the main cause of concern in Service patients. With tannic acid there were some appalling results, some probably made worse by bad splinting and bad treatment. With saline baths and irrigation, and constant expert supervision, the results improved, though there were still some bad ones. At Oxford the immediate application of plaster has been successful, and prolonged immobilisation, with constant care, has seemed no disadvantage. Others think the time for plaster is later, when œdema has subsided, and till then use sulphanilamide, tullegras, light splinting, and high elevation. The cardinal principle underlying all local treatment, as WAKELEY was urging in 1918, is the prevention of scar-tissue proliferation by skin-grafting as soon as the dead tissues have separated, for as soon as epithelium covers an area fibroblast development ceases. But hurrying the separation of dead tissues carries with it dangers—it takes time for a barrier to be built to seal off tendons and joints. If by violent irrigation the slough is got away early there may as yet be no barrier and infection of an underlying joint or tendon may then be inevitable. Moreover we need not to hurry the epithelium but to delay the fibroblast, whose growth may be stimulated by too early movement, over-splinting or passive stretching. Frequent dressings, too, will tear tender tissues so that more scar-tissue is laid down. To get the minimal scar we must combat sepsis and give maximal rest by minimal interference. Perhaps we shall see more done in the prevention of keloid by early radiotherapy when the technique described in our issue of April 11 by LEVITT and GILLIES has been fully developed. WAKELEY[7] advocates the prolonged use of lanolin and massage as part of the after-treatment, and the application of superficial X-ray therapy at the earliest sign of keloid formation. He would see a superficial X-ray therapy apparatus in every burns unit. Radiotherapy can do much for the established keloid, especially the red fleshy type, and GILLIES[1] has lately shown what reconstructive surgery can do for some badly scarred faces and hands. For the large burnt area, as on the thigh, he urges that excision and immediate skin-grafting should be practised more often; nor is it necessary to wait until the scar has fully contracted before beginning reconstructive surgery. If this war has put burns at the head of the list of disabling and deforming injuries, then, at least, it has stimulated counter measures. What is most needed now is a frank record of the results of different methods of treatment.

5. Berman, J. K. Synopsis of the Principles of Surgery. London, 1940, p. 118.
6. Medawar, P. B. *Lancet*, 1942, i, 350.

TYPHUS IMMUNISATION

EPIDEMIC typhus, which has been one of the great scourges of mankind in periods of war and famine, continues to rear its head in Spain, the Balkans, Germany, Poland and Russia. Nearly 46,000 cases were reported in European Russia in 1936,[1] over 4000 in Spain from January to June and 370 in July, 1941, and 1000 and 170 for the same periods in Germany.[2] Though there are rumours that the disease is being spread in Germany by the return of infected soldiers from the Russian front it is impossible to obtain accurate information of the number of cases. There, as in most European countries, preventive measures are being thoroughly overhauled.

There are various basic methods of combating the spread of exanthematic typhus. It is essential to have a large number of personnel thoroughly trained in carrying out the delousing of human beings and their property. It is also desirable, when possible, to reduce malnutrition in the population, for MACKENZIE[3] considers this more important than overcrowding in producing an epidemic in an endemic area. These methods of attack are a heavy drain on the economic and food resources of both civil and military authorities in a country at war. If a method of vaccination could be evolved which would immunise satisfactorily, then the trained personnel, already immune, could more easily deal with the delousing of the population until general immunisation could be carried out in the affected area. Ever since the recognition of rickettsia as the causative agent of typhus fever attempts have been made to prepare a vaccine which would safely and effectively immunise against the disease. Innumerable preparations from human beings, lice, guineapigs, mice and fleas have been tried. Some have contained living rickettsia, such as the murine strain passed through

7. Wakeley, C. P. G. *Ibid*, April 4, 1942, p. 104.

mouse brain and enveloped in egg-yolk[4] or attenuated with bile,[5] and that present in the fæces of rat fleas.[6] These vaccines may cause severe reactions in Europeans and in one trial of living murine typhus virus on 500 people in an asylum in Seville there was no evidence that the course of the epidemic had been influenced in any way. There is always the possibility that such a vaccine used in a population infested with lice may increase the severity of the epidemic, for it is probable that the murine type may be converted into the exanthematic by louse passage from human to human. Killed exanthematic rickettsia were first used in 1918 by DA ROCHA LIMA,[7] who found that some immunity was produced by repeated injections of phenolised emulsions of lice infected with *Rickettsia prowazeki*. Following the same idea WEIGL[8] in 1930 tried carrying out immunisation on a larger scale by using the phenolised intestinal contents of lice infected per rectum with *R. prowazeki* obtained from the brains of infected guineapigs. This method necessitates a huge stock of lice which need a large staff of immune persons on whom they can feed. The technique of injection is very delicate and between 200 and 300 lice are necessary to provide sufficient vaccine for one person, so this is an impracticable method of preparing vaccine for large-scale immunisation. More recently it has been found that large quantities of rickettsia are produced in the lung following intranasal inoculation of mice and rats, and DURAND and GIROUD[9] have used this source to prepare a vaccine with exanthematic typhus rickettsia, and CASTANEDA[10] with the Mexican murine strain. The vaccine which has given the most promise with regard to simpleness of production and minimum of reaction following injection has been evolved from the finding of COX[11] that the rickettsia grow in profusion in the yolk sac of developing chick embryos. Pure suspensions of rickettsia are obtained from the yolk sac of infected eggs by differential centrifugation, and inactivation is carried out by the addition of phenol to 1% and formalin to 0·5%. It is possible to provide 85–100 c.cm., or sufficient for 25–30 people, from fourteen embryos.[12] At the Sukum Laboratory, in the Caucasus, the Otto strain of exanthematic typhus rickettsia has been regenerated by passage from infected monkeys to normal monkeys by lice. This strain has been used for tissue cultures and egg inoculation by Cox's method, and a vaccine has been made, three doses of which have been found to immunise guineapigs and monkeys.

All these vaccines of killed rickettsia have been found to protect experimental animals against the disease but in man the results are not so satisfactory. Weigl's vaccine has been used in Poland,[13] Slovakia[14] and Ethiopia,[15] where it appears to have been of considerable value. In China[16] it was found that the Weil-Felix reaction was positive and specific typhus rickettsial agglutinins were present in the majority of sera of those recently inoculated but there was no parallelism or constancy between the titres of the respective antibodies. However, the rickettsial agglutinins decreased more than did the proteus agglutinins. Insufficient data are available on immunisation of human beings to judge the effectiveness of the mouse and rat lung preparations, but some individuals immunised by this method have suffered no ill effects when subsequently injected with living cultures of *R. prowazeki*. The test for potency of the yolk-sac vaccines made by Cox's method or variations of it usually consists of three doses of 1 c.cm. each injected intraperitoneally at weekly intervals in guineapigs weighing 300 or 350 g. This will protect the guineapig against between 1000 and 10,000 infective guineapig doses of *R. prowazeki* in the form of infected guineapig brain. Since this is the same initial course of vaccine as suggested for human beings weighing 60 or 70 kg. it is not hard to understand why serological evidence of the immunising value of this vaccine has been slow in coming. The production of a positive Weil-Felix reaction and neutralising antibodies as tested by Giroud's intradermal rabbit test has been irregular in individuals inoculated from the same sample of vaccine. There have been a number of laboratory infections with both exanthematic and murine strains of typhus in people who have had three or more injections of the vaccine sufficiently long beforehand for the expected development of immune bodies. However, these workers have all been repeatedly exposed to high concentrations of the living rickettsia so it is not fair to judge the vaccine's effectiveness from this. These three injections and repeated stimulating doses at six months' intervals, as recommended by the American war department[17] for all troops going to typhus areas, may be the solution of the question, but there is little or no available evidence of its effectiveness in the field. The only large-scale trial has been in Spain, where some 20,000 people had been inoculated when the Rockefeller workers left the country in 1941 before they were able to evaluate the effect of vaccination. Many more people have been inoculated since then and Spanish medical opinion is that it has helped to control the spread of the disease. The fact that this vaccine in relatively large doses has effectively immunised guineapigs suggests that the essential factor for better immunisation of human beings is a greater quantity of the killed rickettsial bodies, which will depend on improved methods of culture and refinement in methods of preparation. Perhaps a strain of rickettsia will be evolved which it will be possible to use in the living state, as a result of attenuation either gradually during egg passage or suddenly as with the virus now used for yellow-fever immunisation. The results of serological tests that have been done on individuals inoculated with killed rickettsia once more give rise to the question of the exact relation between the Weil-Felix reaction and immunity. Experiments are necessary on a large scale to try and relate this reaction to actual production of neutralising antibodies.

The Germans are using a vaccine, source unknown, which rumour has it produces sufficient reaction for army personnel to be rested the day of inoculation. The Russians also are probably carrying out large-scale immunisation, and it would be interesting to know what are their methods and results. The general impression is that large-scale immunisation is not practicable with the vaccine available in America and Great Britain, except for those in areas threatened by the disease and in a position to have repeated inoculations.

1. *Ann. epidem. Rep. Hlth Sect. L.o.N.* for 1938, III Hygiene, p. 60.—2. *Publ. Hlth Rep., Wash.* 1941, **56**, 1934.—3. Mackenzie, M. D. *Proc. R. Soc. Med.* 1941, **35**, 141.—4. Laigret, J., Durand, R., Belfort, J. and Lefaucheur, J. *Arch. Inst. Pasteur Afr. N.* 1937, **26**, 453.—5. Blanc, G. *Int. Congr. trop. Med. Amsterdam*, 1938, **1**,

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Annotations

TRANSFUSION AND SYPHILIS

WHEN large numbers of donors are being bled any medical practitioner is liable to find a positive Wassermann reaction in a patient who has recently given blood for transfusion. This may give him anxiety. But he should be aware that all the transfusion services have anticipated this possibility and have made sure that syphilis will not be transmitted in such circumstances. The safeguards depend upon the use of the Wassermann or Kahn reaction, filtration of the plasma or serum, and the lethal effect of cold upon the treponema. The following procedures were agreed upon by a committee of representatives of the civilian and military emergency blood-transfusion services, after considering the opinions of those with experience in the various aspects of the subject. When the donor's blood is to be used for whole-blood transfusion it is not issued unless the Wassermann or Kahn test on the blood in each bottle is found to be negative. If positive to either of these tests it is discarded. While the test is in progress the bottle is stored at + 4° C. and as the blood is rarely used within 24–48 hours the lethal effect of cold on the treponema provides an additional safeguard. When the donor's blood is used for the preparation of plasma or serum the Wassermann or Kahn test is not necessarily performed. The plasma or serum is pooled and during the processing the product is held for 60–80 hours at + 4° C. After this it is filtered through a Seitz bacterial filter. All experimental work indicates that the *Treponema pallidum* will not survive such long periods in the cold, and the additional protection provided by filtration makes for absolute safety. At the time of a donor's enrolment no routine Wassermann or Kahn test is made, because it occupies much time and provides no complete safeguard since the donor may become infected between the time of enrolment and subsequent bleeding. When a hospital relies on a small local panel for fresh blood transfusions, only reliable donors who are fully cognisant of their responsibility should be accepted and a Wassermann or Kahn reaction on enrolment then provides sufficient safeguard.

MORE NURSING COMPARISONS

AMERICA is appealing for fifty thousand women between 18 and 35 to enrol as nurses.[1] High-school education is required of candidates, college education preferred. The shortage there, it seems, is of graduate nurses whom these student nurses are to supplement, with a prospect of good and satisfylng careers later on. The opportunities open to them range from bedside nursing to deanship of a university school of nursing, from service as a rural nurse to supervision of a state public health nursing service, from being hostess on an aircraft to directing three thousand nurses in municipal hospitals. Professional opportunities for the nurse are thus much wider in America than here—a fact which many of our nurses now serving abroad with the Forces can hardly fail to appreciate. Those in the Queen Alexandra's Imperial Military Nursing Service and the Territorial Army Nursing Service now hold commissions ranking as equivalent to lieutenant, major or higher Army ranks. They are nowadays undertaking every possible branch of nursing, including the nursing of tropical diseases, and are working under medical officers who have qualified in Great Britain, the Dominions and the allied countries. They share their mess with nurses trained in Poland and Palestine and are serving in combined hospitals with Indian, Burmese and Cingalese nurses. All this must necessarily broaden their outlook and give them a wider conception of the scope of their profession. Contact with nurses from the Dominions and the United States must be giving them insight into terms of service elsewhere and they can hardly fail to be discomfited by some aspects of the comparison. Rates of pay, conditions of training and status of the profession are better in those countries; moreover, the line is drawn much more firmly, there, between a state-registered nurse and a nursing auxiliary without a qualification. While we can still turn out the best practical nurses in the world other countries are steadily drawing ahead in establishing the dignity and advancement of the profession. It is for our own nurses to see that the pace here is mended.

1. See *Medical Record*, 1942, **155**, 10.

Continued from previous page

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VARRIER-JONES MEMORIAL LECTURES

AT the time of his sudden death last year Sir Pendrill Varrier-Jones was promoting a course of lectures by eminent authorities on various aspects of medical and surgical tuberculosis, including early diagnosis, aftercare and rehabilitation. It is now proposed that part of a memorial in his honour should take the form of realising this scheme and it is thought that the most practical method would be for such lectures to be given at Service hospitals, particularly at those where medical and surgical conferences are already being held from time to time. After the war the intention is for the lectures to be given both at Papworth and at the principal medical centres. A memorial fund has been opened and subscriptions, marked "Varrier-Jones Memorial Fund," should be sent to the secretary, Papworth Village Settlement, Cambridgeshire. In the meantime, commanding officers of Service hospitals who wish to have such lectures given should send a request to the secretary.

A LONDON SCHOOL OF RADIOTHERAPY

THE day is long past when anyone with an elementary knowledge of electricity could buy the appropriate apparatus and start practice as a radiotherapist. The potencies for good and evil in a modern X-ray plant are very great, and to obtain the benefits without the drawbacks an intimate knowledge of certain physical and biological problems is demanded, and no-one can have this knowledge unless he has undergone a specific and detailed training. The would-be radiologist needs a high standard of clinical wisdom and ability; in addition he will have to master the intricate physical and biological aspects of radiation before he can safely and beneficially practise his intended branch of medicine. Such a prospect will discourage all but the keenest men, and this no doubt explains the dearth of accomplished radiotherapists in the country. One method of facilitating the embryo radiologist's progress to a diploma and specialist practice would be to provide him with a school of radiology wherein he may have the best opportunity for adequate instruction; and it is depressing to admit that in London no such school exists or has existed, except during the five years or so from 1932 onward during which a complete course for radiological students was provided at the Royal Cancer Hospital (Free) under Prof. Woodburn Morison. Happily there is a prospect that a school will soon be established by the authorities of the Middlesex Hospital, and it will be under the control of a teacher with the status of a professor of the University of London. In this school there will be provision for the study of the physics of radiation and of the uses of radiation in therapy. Presumably there will be instruction also in the important

subject of X-ray diagnosis. It appears uncertain whether the proposed department will be allowed to form a complete unit of the hospital, with beds under the professor's own control.

ACCURATE BLOOD-GROUPING

DETERMINING a person's blood-group seems one of the simplest procedures of clinical pathology. The patient's finger is pricked, a little blood is run into some citrate solution, the red-cell suspension is mixed on a slide with anti-A and anti-B test sera; if the cells are agglutinated by both the group is AB, if by neither it is O, if agglutination occurs with anti-A only the group is A, if with anti-B only it is B. Yet in spite of this surface simplicity, mistakes and accidents keep happening, and with mistaken blood groups the results may be grim. G. L. Taylor and his colleagues[1] at the Galton Laboratory, Cambridge, have proposed a technique which will give a high degree of reliability in the determination of these ABO blood-groups; the available knowledge of the snags of blood-grouping is combined with a scheme of which orderly method is the keynote. It differs from the popular simple scheme in several ways. First, both red cells and serum from each sample are grouped. Either a citrated and a clotted sample can be taken, or one sample of clotted blood will do, since sufficient red cells can easily be obtained from the blood-clot after removal of the serum. For testing both sera and cell-suspensions of known groups are kept handy; the anti-A and anti-B sera are of tested titre, are stored frozen solid in small containers and are diluted 1 : 2 for use; the cell-suspensions of known A or B cells are about 5% strength. The reactions are carried out in small test-tubes, not on slides, and all negative results are checked by microscopic examination. The reactions of the test cells and sera are always checked before use. A specimen of blood is tested as follows: 1 volume of serum is put into each of two test-tubes, diluted with 1 volume of saline, and 1 volume of suspension of A cells is added to one tube and B cells to the other; the unknown red cells are similarly added to diluted anti-A and anti-B sera. The tubes are capped, kept in the cold for 2 hours, and the results then read. Workers should be in pairs, and an experienced pair can read the double tests on 100 samples in about half an hour. Taylor and his colleagues also point out how the fallacy of reporting group A_2B as group B can be avoided by re-testing the serum of every reported group B against known A_2 cells; if there is a reaction, the group B is confirmed since the serum is thus shown to contain the antibody α which reacts with A_2 as well as with A_1 cells, so that the unknown blood cannot be either group A_1B or A_2B. It is necessary to use A_2 and not A_1 cells since the serum of some A_2B persons contains the antibody α, which reacts with A_1 but not A_2 cells, hence if A_1 cells are used in such a case the reaction will incorrectly indicate group B. No-one who has to determine blood-groups, whether on a large scale or only as occasion demands, should fail to digest the advice given in this paper.

WHERE THE WASTE PAPER GOES

SOME hospitals have lately given their clinical records for salvage—Guy's, for instance, handed in 4½ tons of clinical and X-ray records—and though this may seem sacrilege the need justifies extreme measures. Before the war most of the waste paper collected went to the manufacturers of corrugated paper, the cheaper wrapping papers and paper board, an important material used in making packing cases and containers, the shanks, stiffeners and insoles of boots and shoes, trunks and suitcases, insulating and wallboard for building, and in bookbinding. The remaining and largest section of the paper industry relied on imported wood pulp, supplemented by a little pulp made from esparto grass and rags. A great deal of both paper and board was imported ready made from Scandinavia, Finland and Holland, the United States, Canada and Newfoundland. The German occupation of Norway immediately cut us off from the main source of supply of wood pulp—Scandinavia and Finland—and enemy activity in the Mediterranean, in conjunction with the need for conserving shipping, subsequently cut off supplies of esparto grass, which is obtained from North Africa. Canada and the United States were left as the only producers of wood pulp from whom supplies could be obtained, and the United States normally used more than it makes. The spread of the war has since made shipping space a primary consideration; imports are now small and likely to become still smaller. Meanwhile our expanding munitions industry calls for more and more paper—for shell, bomb and cartridge containers, gun fuses, some of the working parts of mines, dust-covers for aero-engines and the like. Hence the need for making the best use of all home-produced or home-accumulated materials suitable for paper making. Straw, rags, waste wood and hemp and jute bagging are being used as far as possible but they require special boiling plant which few mills possess. This plant is being installed and extended, but the potential output of pulp from these sources is quite inadequate to maintain essential supplies. As in the last war we have had to fall back on waste paper, and this has the advantages that existing machinery can be adapted for reconverting it into pulp, that it consists almost entirely of good paper-making fibre, that the basis of a nation-wide organisation for its collection already existed, and that there was a great deal of it. The ink does not matter for most war-time purposes—it gets evenly distributed and produces the grey tint to which we are already accustomed in our cartons. For whiter papers the ink must be bleached out or materials which have not been printed on must be used. The inferior qualities of waste—cardboard, heavily printed and coloured paper—can quite well be made into board. Most local authorities are compelled to provide a regular collecting service and they have so far collected 600,000 tons of waste paper. All paper collected is graded by the merchants and local authorities and allocated to the mills which can make the best use of each grade by the Paper Control of the Ministry of Supply, and they also issue licences to consumers of finished paper and board.

The Salvage Controller says there are still hundreds of thousands of tons of unwanted books and magazines lying about in our homes, and that business and professional men are still holding back old journals and other papers. No doubt he is right, and we shall not have done our best to help the supply of munitions until we have yielded up every cardboard box, every old letter and every book and periodical that we can spare.

TRANSMISSION OF CANCER BY SUCKLING

IN the early days of the Imperial Cancer Research Fund the then popular belief in the inheritance of cancer was examined critically and put to the test of experiment. Familial incidence which had convinced many people of a heritable factor was reasonably explained by cancer being so widespread that few large families could escape. Two or more members in the same or different generations or both might develop tumours in the same organ quite within the range of statistical probability. Selective breeding from cancerous parents in mice on the other hand led Murray[1] to the conclusion that mice which had a recent cancerous ancestry, mother or grandmother or both, were three times as likely to develop mammary cancer as mice with healthy forbears. In human cancer, inbreeding to this degree is so unlikely as to rule out heredity as a potent factor in carcinogenesis. Probably for this reason Murray's work was not followed up for

1. Taylor, G. L., Race, R. R., Prior, A. M. and Ikin, E. W. *J. Path. Bact.* 1942, **54**, 81.

1. Murray, J. A. 4th scientific report of the Imperial Cancer Research Fund, London, 1911.

several years. The history of cancer research teaches however that no fact, if it be a fact, is so odd, so unusual or so trivial that it can be ignored without loss to our insight, and in his story of subsequent research into cancer of the breast Gye[2] has verified this maxim. Although heredity may not play a large part in contributing towards cancer as a whole, its influence cannot be neglected. Following Murray's work, Loeb and others in America proved that by inbreeding from cancerous mice comparatively pure lines could be obtained having a high incidence of mammary cancer. This inherited quality was dependent upon ovarian secretion because, if the ovaries of the young mice were removed before they were 3 months old, the incidence was much diminished. The ovarian influence was next shown by Lacassagne to hold even in male mice provided they had a cancerous ancestry among the females of the strain. Œstrin alone without the existence of inherited susceptibility among the treated mice did not raise the incidence in either males or females. Thus it appeared that mammary cancer was dependent upon two factors working together, an inherited susceptibility and the action of the ovarian hormone. The sequence was however disturbed by the demonstration that the inherited susceptibility appeared to be derived exclusively from the mother. Hybrid mice, the progeny of high cancer-strain mothers and low cancer-strain fathers, retained the high cancer rate undiminished; but low cancer-strain mothers and high cancer-strain fathers produced young giving a low cancer rate when they matured. Thus the maternal influence was predominant. Finally this influence was proved to reside in the mother's milk. When nursling mice from a high cancer line were fostered by mothers of a low cancer line, the incidence of mammary cancer fell. When care was taken to prevent any contamination of the young by their mothers, the incidence fell to zero. The influence, whatever it was, failed to be transmitted by inheritance or to pass through the placenta. Succeeding generations bred from these uncontaminated fostered mice also had a low cancer incidence. A high cancer rate could be restored at any time to the progeny by allowing them to have milk from high cancer-strain mothers. The same factor which is carried in the milk can be obtained from blood, from internal organs and from spontaneous tumours. J. J. Bittner, the discoverer of the milk factor, has reached the provisional conclusion that it is a virus. Here for the moment the story of mammary cancer ends in the quite unexpected support which it offers to the virus theory of the cause of cancer. This valuable new technique for investigating the problem of cancer is being widely exploited now in many laboratories, and more is likely to be heard of it.

YARDSTICKS FOR MOTHER WIT

INVITED to discuss the testing of intellectual capacity in adults, speakers at the section of psychiatry of the Royal Society of Medicine, on April 14, found themselves tangled in a vocabulary test at the outset. What is this intellectual capacity? Mr. J. C. Raven distinguished it from mere retentivity and quoted Spearman's definition of it as "the ability to reason by analogy from awareness of the relations between experienced characters"—no easy thing to measure, even if it remained constant in every subject or in every phase of his activity, which no-one seemed to think it did. Commander C. G. Tooth, brushing aside definitions, called it "mother wit," which by traditional association locks intellectual capacity with personality and thus carries a clearer meaning. He also knew exactly what kind of test of it would be welcome in the Navy: one which could be given as a group test, by people without knowledge of psychiatry, and completed in 20 minutes. No-one seemed inclined to indulge him with suggestions; indeed much of the discussion dealt with what tests would not do, rather than with what they would. Dr. Noel Burke pointed out that no test has been devised which can be solved in one way only—that is, by any single intellectual approach or process. Dr. C. J. C. Earl remarked that, far from measuring intelligence, existing tests only indicated the level of organised behaviour in a standard situation; decisions about a man's intellectual capacity could only be made on the basis of all the evidence available, not on the results of tests alone. Dr. F. J. S. Esher had found progressive matrices a practical preliminary test for psychoneurotic soldiers who seemed dull and backward when admitted to hospital. Later he gave Terman's tests, Passalon, Koh's blocks and other tests, offering as wide a series as possible so as to give scope to special aptitudes. Mr. Raven thought non-verbal tests more reliable than verbal, though group verbal tests were useful in assessing whether instructions were understood and whether men wrote a legible hand. Capacity for leadership, he said, depends on the power to make quick, clear, accurate judgments based on sound knowledge, and men can be given a chance to acquire this; thus they can be tested before a course of training and given a different test of the same type after the course, to see how their rate of performance changes. All agreed that intellectual capacity is only one component of the whole personality and cannot be separated from it, even in a test situation. Thus the rate at which a man can see relationships and reason from analogy depends not only on his intellectual capacity but on his fund of information, which in turn depends on memory, experience, education, age, and (coming full circle) intellectual capacity. Moreover, his performance may vary with his health, mood, temperament and opinion of the tester. At best it is only possible, as Dr. Earl put it, to get a rough measure of general intelligence, because intelligence is not a unit variable. In any case, we want to be able to tell not only how intelligent a man is but how he is intelligent, how his capacity and his personality interlock. A psychiatrist conducting a test—particularly a performance test—has a chance to do this; he can see where the subject abandons reason for trial and error, whether he is put off by novelty or difficulty, whether he is excitable or inhibited, careless or overcareful, unwilling to try or futilely persistent, and how he responds to success and failure. And more psychiatrists might be trained to do this. True it takes time; but when it is a question of shutting up one man in an institution or sending another to a position of responsibility, Dr. Earl suggests that two hours is hardly too much to spend in answering it. It is disconcerting to find that, in spite of all tests, the psychiatrist is ultimately expected to use his clinical judgment—a demoded entity deriving almost entirely from mother wit.

ELIMINATION OF TRICHINÆ

HITHERTO the only sure method of killing the trichinæ in pork has been thorough cooking; the process to which canned pork is subjected is said to eliminate all risk, whereas curing alone does not. The United States department of agriculture has lately shown (*Science*, 1942, **95**, 14) that freezing can be equally effective. Sections of meat not more than 6 in. thick can be freed of parasites by being kept at 5° F. for twenty days, at −10° F. for ten days, or at −20° F. for six days. Thicker pieces require longer freezing. The department points out that in many cold-storage plants the temperature is not low enough to ensure a complete kill of trichinæ.

2. Gye, W. E. 39th annual report of the same, just appeared.

NAVAL MEDICAL COMPASSIONATE FUND.—A meeting of subscribers will be held at 3 P.M. on May 1, at the Medical Department of the Navy, 64, St. James's Street, London, S.W.1, to elect six directors.

Special Articles

DIRECT-READING PHOTOELECTRIC COLORIMETER

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A LARGE proportion of modern microanalytical procedure depends on the production of a colour. The assessment of this colour, which gives the measure of the amount of the substance present, has usually been made by means of a Duboscq colorimeter or a photometer. These instruments are now giving place to photoelectric colorimeters, which estimate the intensity of colour in a solution by measuring photoelectrically the proportion of incident light which is absorbed by the coloured solution. Typical instruments are the Evelyn (1936), the Hilger (1936), and the Summerson (1939). When light falls on a photoelectric cell the current generated can be measured by connecting the cell to a galvanometer. The degree of deflection of the galvanometer needle depends on the amount of current generated, and this depends on the amount of light falling on the photoelectric cell. If a coloured solution is interposed between the source of light and the photoelectric cell some of the light is absorbed, less electricity is generated and a smaller deflection of the galvanometer takes place. A more strongly coloured solution will absorb more light, still less electricity will be generated, and the deflection will be still smaller. The degree of deflection of the galvanometer, therefore, can be used to give us a measure of the intensity of colour in the solution, and hence of the concentration of the substance being analysed.

The instrument here described makes use of this simple principle. It has been in use for routine and research in these laboratories for two years and has largely displaced the visual comparison colorimeters formerly in use. Some of the advantages of photoelectric colorimetry over visual colorimetry are the much greater speed and ease of colour measurement, and the elimination of eye fatigue and personal error.

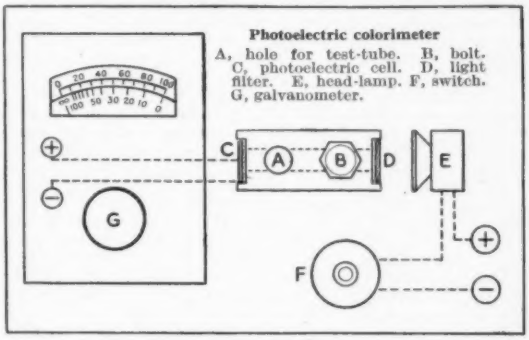
CONSTRUCTION

The construction and assembly of the instrument are illustrated in the diagram. An ordinary surgical head-lamp (Ever-ready) furnishes the source of light (E). The bulb is activated from an accumulator, which ensures that a steady, non-fluctuating, light is obtained. Immediately in front of the lamp is mounted a block of wood (well-seasoned teak or oak 3 × 3 × 2 in.) which has been bored vertically to fit a ⅝ in. test-tube (A) and a ½ × 2 in. metal bolt (B) whose nut is countersunk in the block. The bolt, which should fit its hole tightly, is used to vary the size of the slot through which the light passes. The slot is made by boring a ½ in. hole from front to back, cutting through the vertical holes, and then sawing up from the bottom of the block to make the slot ½ in. wide by 1½ in. high. At the front of the block a groove is made 1 in. wide and ¼ in. deep to carry a light filter (D). A similar groove ⅞ in. wide is made at the back of the block to fit the photoelectric cell (C). The block is mounted on a 3 × 5 in. piece of wood, and the ⅝ in. hole is extended ½ in. into the second piece so that the end of the test-tube drops below the bottom of the slot.

The photoelectric cell is of the selenium type, 22 × 40 mm. The 'EEL' electroselenium cell supplied by Messrs. Arthur E. Evans of London has proved satisfactory. A copper wire is fitted on the surface of the rear groove in suitable position to make contact with the exposed strip of selenium which lies near the edges of the front surface of the cell. The wire is connected to an ordinary electric pole screwed into the back of the block. A lead from this front-surface pole connects with the negative pole of the galvanometer. A second pole carries a spring clip which holds the photoelectric cell in place and makes contact with its back surface. The back-surface pole is connected to the positive pole of the galvanometer.

Light filters of glass have been used. The Chance red (No. 2), green (No. 4), and blue-green (No. 5) glass filters have been found suitable for most purposes. Both the sensitivity and accuracy of colour measurement are increased by the use of light filters. As in visual photometry, the measurement o colour intensity by photoelectric means is best carried out in light restricted to parts of the spectrum whose light is maximally absorbed by the coloured solution under investigation. This condition is approximated with the filters recommended.

The galvanometer for use with this instrument should be of about 1000 ohms resistance and should have a maximum deflection corresponding to about 10 microamperes. The pointer type and the reflector type have been found equally satisfactory. A suitable reflector instrument was supplied by Messrs. Gallenkamp of London, and a pointer instrument by Messrs. Unicam of Cambridge. A completely assembled instrument made by Messrs. Gallenkamp was likewise satisfactory. The most convenient galvanometer scale is a logarithmic one on which the zero point corresponds to maximum deflection. The galvanometer reading on the logarithmic scale is then directly proportional to the light absorbed.*



Photoelectric colorimeter
A, hole for test-tube. B, bolt. C, photoelectric cell. D, light filter. E, head-lamp. F, switch. G, galvanometer.

A set of coloured solutions containing varying amounts of the same pigment will give readings which are directly proportional to the concentration.

OPERATION OF THE INSTRUMENT

The galvanometer is levelled, the suspension is released and the "spot" or pointer adjusted to the ∞ mark at the left of logarithmic scale (0 on the linear scale) by turning the suspension knob. The light is now switched on. The bolt is turned up or down to regulate the amount of light reaching the photoelectric cell, until the needle is at 0. It should remain at this point and will do so after the first few minutes if the electric supply is taken from a properly charged accumulator.

A set of test-tubes are selected which will fit the hole snugly but easily. They should all be of similar glass and free from obvious streaks and scratches. A test-tube is half filled with water, wiped with a towel to remove any stains and placed in the hole. The bolt is turned until the needle is at 0. A scratch is made on the side of the test-tube opposite a mark on the block to indicate that the tube should always be used in that position. If on turning the tube in the hole more than a scarcely perceptible movement of the needle takes place the tube should be discarded since it contains flaws in the

* The logarithmic scale used is, in fact, that of the extinction "E." If the full deflection of the galvanometer is divided into a linear scale of 100 equal parts, on which 0 corresponds to darkness and 100 to the point of full-scale deflection with 100% of incident light, then any readings less than 100 will correspond to percentages of light transmission which are less than 100% of the incident light. They can be thought of as different degrees of extinction of the incident light. The extinction E or "optical density" is defined as the logarithm of the ratio of incident to transmitted light—i.e., E = log. 100/% transmitted light. If two solutions of different optical density are interposed in the light path, then their extinctions E will be in the same relation one to the other as their concentrations of pigment—i.e., $E_1/E_2 = C_1/C_2$. This simple photometric expression of Beer's law defines the condition to be aimed at with a photoelectric colorimeter. To simplify the reading of E, and hence to simplify the calculation, the logarithmic scale is used on the galvanometer. It is arrived at in the following way. If, for instance, a coloured solution transmits only 50% of the incident light—i.e., gives a reading of 50 on the linear scale—then its extinction E = log. 100/50 = 0·301. The point opposite 50 on the linear scale is marked 0·301 on the logarithmic scale. Similarly, 100 on the linear scale is 0 on the logarithmic, 10 on the linear is 1 (log. 100/10 = 1) on the logarithmic, and so on. For convenience, the values of E, which comprise the logarithmic scale, are multiplied by 100, and are plotted as whole numbers. The extinction E of a coloured solution is spoken of as the "extinction coefficient" when it is determined at ,or reduced to, a solution depth of unity—i.e., 1 cm.

glass which are interfering with the passage of light. The other tubes are tested similarly and a mark made on each to indicate in which position it should be inserted to ensure equal light transmission. These tubes may now be used interchangeably. The reactions leading to the production of the coloured solutions may be carried out in them so that no transference of the solution is necessary when it is read in the colorimeter. A good quality of fairly thin-walled test-tubes should be used.† The most convenient size is $\frac{5}{8} \times 5$ in. It will be found useful to mark them with a file to indicate volumes of 5 c.cm., 10 c.cm. and 15 c.cm.

The appropriate light filter for a coloured solution is next tested for. This will usually be the filter which gives the highest reading—i.e., absorbs most light—and which gives most nearly a direct proportionality in reading with different concentrations of pigment. Generally speaking its colour will be "complementary" to that of the solution—for a blue or green solution a red filter, for a yellow solution a blue filter, and for a red solution a green filter. The selection of the filter is made as follows.

With the filter and test-tube of water in place, the galvanometer needle is adjusted to 0 by turning the bolt. The test-tube of water is removed and another containing the colour standard is inserted. The galvanometer needle is allowed to come to rest and the reading is recorded. On replacing the tube of water the needle should return to 0. If it fails to do so, the light is again adjusted by turning the bolt and the reading for the standard is again taken. This operation is now repeated with a second standard of double the strength of the first. The reading of the second standard should be twice that of the first. If this condition is not fulfilled, another light filter is tried. If the proportionality is approximated but not reached, the fault probably lies in the presence of a "blank" colour—i.e., a colour arising from the reagents which have been used to produce the colour by reaction with the standard substance. A "blank" consisting of the reagents and water, with no added standard, is prepared and substituted for the water in the 0 adjustment. Proportionality should now be obtainable with the appropriate filter.

APPLICATION OF METHODS OF BLOOD ANALYSIS TO THE PHOTOELECTRIC COLORIMETER

Method	Changes if any	Light filter
Urea	Use a "blank"—i.e., 7 c.cm. water and 1 c.cm. Nessler's for 0 adjustment.	Chance blue-green
Non-protein nitrogen	,,	,,
Uric acid	Dilute coloured solutions (standards and tests) to 5 c.cm.	Chance red
Inorganic phosphate*	—	,,
Cholesterol	—	,,
Glucose	Dilute to 10 c.cm.	,,
Sulphanilamide	—	Chance green.
Plasma proteins	(See urea)	Chance blue-green
Bilirubin*	—	Chance green.
Phosphatase	Dilute to 10 c.cm.	Chance red
Sodium	Dilute 1 in 10 with dilute acetic acid	Chance blue-green
Potassium	—	Chance red
Hæmoglobin—		
(acid hæmatin)	—	Chance blue-green
(alkaline hæmatin)	—	Chance green
(carboxylhæmoglobin)	—	,,

* An adaptor, to accommodate smaller bore tubes in the test-tubes hole of the colorimeter, is useful in determinations where only a small volume of coloured solution is available.

Use with standards.—The use of a natural standard—that is, a solution containing a known amount of the substance under investigation—is almost universal in colorimetric practice with Duboscq type instruments. The preparation of a standard each time a determination is made has another use besides furnishing a basis for colorimetric comparison—it is the easiest way of testing if anything has gone amiss in the analytical procedure. For this reason the use of standard solutions should be continued with the photoelectric colorimeter. When the present direct-reading type, with a logarithmic scale, is used the calculation is simply that of direct proportionality—

Reading of test/Reading of standard × concentration of standard = concentration of test.

† For more accurate work the very thin walled and uniform test-tubes of the type used in the Lovibond comparator are useful.

The factor Reading of test/Reading of standard is reversed from that used with the Duboscq instrument, since the proportionality is here a direct, whereas with the Duboscq it is an inverse proportionality.

The micromethods of analysis for blood which have been described by King and others (1937, 1942) have been readily adjusted for use with the photoelectric instrument. Very few changes have been necessary: they are given in the table, together with the light filter recommended for each method. As in visual colorimetry the reading of the standard which is nearest the test should be used in the calculation.

Use without standards.—A coloured solution of given density will always absorb the same proportion of incident light, provided the light is invariably of the same intensity and wave-length. With any given coloured solution and the proper light filter, therefore, the same difference in galvanometer deflection between water and coloured solution should be obtained. This is the case for any one instrument; different instruments may differ sufficiently in details of construction to give slightly different deflections with the same solution. By calibrating an instrument against a series of standards a factor may be derived or a graph constructed for the calculation of the concentrations of subsequent test solutions of unknown strength. But it must be recognised that the accuracy obtained in this way may not be as great as that which will result from the simultaneous comparison of a standard with the test solution. The reagents used in any analytical procedure may vary slightly from day to day—e.g., by deterioration—and as a consequence the colour produced on one occasion may not be absolutely identical with that produced on another. Moreover the selenium cell may suffer small alterations in its sensitivity and as a consequence the deflection resulting from any given incident light may vary slightly. However, the accuracy obtainable may be sufficient for many routine examinations. If it is desired to use the colorimeter in this way, a separate set of standard graphs or factors should be established for each instrument.

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ROSS INSTITUTE IN INDIA

THE second report * of the India Branch of the Ross Institute, which covers the year ended July 31, 1941, illustrates the words of the Royal Commission on Labour in India: "The close relationship between agriculture and public health is obvious and the two react upon each other to a remarkable degree." Dr. G. C. Ramsay, who has been principal of the branch since its formation eleven years ago, had previous experience of public-health conditions in India extending over twenty-eight years. During that period the improvements effected make it difficult for newcomers to realise what India was like before. When Ramsay went to India it was common for a tea plantation with a population of 1200 to have 200–300 sick attending hospital during the fever season; now the daily average might be a tenth or less. Epidemics of cholera were not infrequent and the lowering of the vital reserve by malaria was responsible for the high incidence of anæmia, pneumonia and tuberculosis. Though the chief public-health measure has been the eradication and control of malaria, attention has been directed to general sanitation, better water-supplies, disposal of night soil, maternal and child welfare.

The anti-malaria measures which have brought about this remarkable change are cheap and simple. Chief of these are the shading of streams, drains and swamps with shade vegetation, or the flushing of streams and rivers by cheap sluicing methods which, when properly installed, completely eliminate all mosquito breeding in water channels. The incorporation of sluice-gates with syphon systems has proved a definite advance; these gates can be opened periodically to flush out silt which is liable to accumulate behind the dams. To produce the right

* From the office of the Committee of Control, Royal Exchange, Calcutta.

degree of shade lantana (*L. oculeata*), basak (*Adhatoda vasica*) and duranta (*D. plumieri*) have been found most suitable in northern tea districts of India, mugwort (*Artemisia vulgaris*) for tea, coffee, cardamom and rubber estates in the south. The test of efficiency is the absence of grass and weeds beneath the shade. Where these cheap horticultural measures (of which pictures are given) cannot be applied, other measures such as site selection, sub-drainage, stone packing, herbage packing, vertical drainage, seepage burial, application of larvicides or destruction of adult insects by house-spraying are employed.

The importance of diet deficiencies has been appreciated by medical officers and estate managers with the result that wherever possible labourers are allotted land for cultivation of rice, maize, vegetables and fruits. On many plantations the managers arrange demonstrations of Soya bean cultivation. Improved breeding has raised the standard of milk-supplies. The success of these various measures has been so evident that industries throughout India are subscribing to the institute. The report contains summaries of the work carried out in many districts with statistical material including spleen indices, blood examinations and mosquito dissections which deserves close study.

MEDICINE AND THE LAW

Attendance on a Fellow Practitioner

BY an ancient and honourable tradition members of the medical profession renounce or reduce their fees for attending a fellow member. Dog, in the crude vernacular of biology, does not eat dog. If the legal implications of gratuitous treatment are vague, disputes are rare. Last month the Court of Session had occasion, in Bruce *v.* Clark, to expound the Scottish law in this matter. A consultant physician in Edinburgh had attended the late Dr. A. W. G. Clark and claimed 200 guineas as the balance of an account for professional services rendered between January, 1938, and the patient's death in September, 1940. No account had been sent to Dr. Clark during his life-time. The pursuer (as the plaintiff is styled in Scotland) stated that he had attended the patient on ordinary professional terms, but had originally modified his charges considerably because the patient was a medical man though apparently not a practising one; Dr. Clark at various times made payments amounting to £61, handing him in an envelope some small sum which he always referred to as a mark of appreciation; Dr. Clark said "the real settlement would come later."

Dr. Clark's executor pleaded in defence the "usual doctor's custom" of gratuitous treatment. It was, he said, the general practice of the medical profession in Scotland that professional attendance and services were given free as between members of the profession. He conceded, however, that death-bed attendance was in a special category and might properly be deemed a service rendered outside the scope of an implied agreement to serve gratuitously. Doubtless the court had, in Scotland as in England, to presume that, in the medical profession as in any other, the rendering of services sets up an implied contract that the recipient will pay for them. Was there a professional custom which excluded this presumption as between fellow members of the medical profession? If the law is invited to take notice of a custom, the custom must be definite and uniform. The judges cannot automatically accept the general practice as a valid legal custom if, when treating a fellow practitioner, one doctor refuses to charge a fee, another charges half his ordinary rate of fees, while a third charges a merely nominal fee. Lord Robertson, who tried the case in the Court of Session, held that the evidence failed to establish any professional custom or practice so uniform and general as to justify the implying of an agreement that the pursuer's services were to be given free. On the other hand he thought that the ancient practice of medical men generally, and their current practice when attending a fellow practitioner, were material as showing that an agreement for gratuitous attendance might be inferred from facts and circumstances ("including silences") which, if the patient were not a medical man, would be inadequate to support any such inference. Applying this construction, Lord Robertson decided that, throughout the period covered by the payments totalling £61, the services were rendered under an agreement to be implied from the facts and circumstances as excluding any legal obligation to make subsequent payment. For the death-bed attendance he awarded 30 guineas.

To sum up, then, the Scottish courts will not assume that one medical man treats another gratuitously, but they will be ready to infer, from the facts and circumstances of a particular case, that the parties intended the treatment to be gratuitous. Whether an English court would make any distinction between death-bed attendance and other medical services seems, in the absence of authority, to be uncertain.

PALESTINE

ENGLISH AND JEWISH DOCTORS MEET

LAST year, in November, a British hospital ship cast anchor in a Palestinian port, and the commander asked the Jewish Medical Association to lecture to his personnel on aspects of medicine which they were likely to encounter in the country. The lectures were duly given and a warm relationship sprang up between the association and the ship's medical staff. Reciprocal lectures were delivered and a group of Jewish physicians visited and inspected the modern equipment of the ship.

PHOTOSENSITISING EFFECTS OF EMOTIONAL STRESS

In the journal *Harefuah*, Dr. Berlin reports the appearance of four common dermatoses—dysidrosis, erythema multiforme, purpura, and lichen planus—in connexion with emotional stress due to air-raids. The changes were confined to the uncovered parts of the skin, and it was suggested that psychogenic factors were responsible for this photosensitising effect.

WAR INJURIES

Professor Fruchaud, chief surgeon to the Free French Army in Syria, recently lectured to the Jewish University at Jerusalem on war injuries. He advised extensive excision of the wound edges to prevent infection. The lecture was attended by doctors of all nationalities now living in Jerusalem.

A NEW AIR-RAID SHELTER

A shelter for the personnel and patients of Hadassah, the University Hospital, has just been completed; it consists of a tunnel, running between the hospital and the nurses' home, and is 80 metres long, by 2·5 m. wide and 2·2 m. high. There are six emergency exits in addition to the two main entrances. The shelter will accommodate 500 people and has electric light and equipment for performing emergency operations; it can be closed against gas-attacks. At present it is certainly the safest and most useful shelter in Palestine.

JERUSALEM HEALTH CENTRE

The work of the Strauss Health Centre during the past year was reported in the *Hadassah Bulletin* for October, 1941. At the clinic for backward children 291 patients were treated; 93 had educational difficulties, 23 showed problems in social behaviour. There was an increase in the numbers attending for nervousness since last year, no doubt owing to war conditions. Lectures on child management have been held for mothers, and have been well attended, the average audience numbering about 50. Consultations have been held on difficulties in married life, but attendances have been fewer owing to the blackout. A special department deals with speech disturbances; as in previous years the male patients outnumber the females in this department by four to one (36 : 9).

EXPERIMENTS IN SOCIAL MEDICINE

Social work at the Tel-Aviv municipal hospital has been begun in various ways. For example, children are looked after whose parents, injured in air-raids, are being treated in the hospital. A common kitchen for diabetics has been established; this was a much-needed measure since supplies of insulin have become extremely difficult to obtain, and many diabetics who could not afford it suffered in health. The kitchen at least provides them with a suitable diet.

A JEWISH BENEVOLENT FUND

The Kupat Cholim Jewish sick fund is the largest in Palestine; 184,000—more than a third of the whole

Jewish population—are members. The report for the year 1939–40 shows that infectious diseases (other than malaria and parotitis) have increased. Scarlet fever, for example, rose from 8 per 1000 in 1939 to 18 per 1000 in 1940, whooping-cough from 1·4 per 1000 to 11. Nearly all Jewish confinements have taken place in hospital; births have risen from 37·98 per 1000 in 1939 to 38·72 per 1000 in 1940, but the general death-rate has also risen owing to war conditions.

DEATH OF A NOTED GYNÆCOLOGIST

Professor Schoenholz, who was for many years chief surgeon to the gynæcological department at Cologne University, died some weeks ago at the age of 48. He emigrated several years ago from Germany to Palestine where his knowledge and operative skill soon created a wide demand for his services. His published work is well known to gynæcologists.

In England Now

A Running Commentary by Peripatetic Correspondents

HAS the *Lancet* an Icelandic correspondent? If so I wish you would give me an introduction to him, for the armour of Icelandic society takes some penetrating. Reykjavik is a fair-sized rambling town on a couple of small hills, with a small harbour and much shipping, with many big American cars but no gas-lamps, dogs, horses, trees or birds (not a sparrow!), with very few cats, but lots of plants, mostly flowering cacti, on the window-sills inside the poorly ventilated centrally heated rooms. The children are beautiful, and the girls remain so, but the boys lose their rather effeminate good looks as they grow up. The girls are very stylishly dressed. I rarely see an unhappy or unhealthy face among the children, and hardly ever hear one cry—probably because they are allowed to run about and amuse themselves indefinitely and are not kept tied to apron-strings. They get plenty of dairy produce if few vegetables, but nowadays the lack of greenery is made up by a free issue of ascorbic-acid tablets. There seems to be a fair amount of tuberculosis among the adults, and I have spotted a few cases (too many) of old rickets, one or two of old poliomyelitis, and a perfect specimen of mongolism, aged about 40.

* * *

The policeman, bare-headed, came out of the farm-house to meet me and led me a field away to a group of outhouses, where two tranquil cows, some self-centred fowls and a pail half full of eggs made the foreground. He lifted the latch of a byre and we looked down on the hay and a dead, hatted farmer; like a snake a deep purple constriction ran round his neck, and all but his hands and legs were stiff. From a beam up above hung a frayed rope and propped up against a wall was a ladder: "He must have brought that in special—it doesn't belong here. She found him when she was getting the eggs." He had not been ill, he had not complained of anything, he had appeared perfectly normal in every way; they could think of nothing that could have worried him except possibly a few ploughing orders; he had no undue financial troubles. His poor old wife told me of his customary cup of tea after dinner; then he had gone out. Her pathetic refrain was, "Oh, I wish he hadn't done that." Everyone here knew him as a steady hard-working reserved man. I felt the horror of one of Hardy's rural tragedies, which seem so exceptional and unlikely in print but are found in the chronicles of every village. Going home I chewed the subject, trying to brush aside a contaminating feeling of guilt. What could have made this fairly prosperous man of 65 with a happy family take his life? First, there must have been some emotional atrophy—no man could plunge his family into tragedy with his full affections. I think in the senile recession love does go out before fear. Then the only way in which he was exceptional was his taciturnity, even at home. I suppose if one did have a genetic defect for word-forming, one's fears would grow by being unverbalised, undefined, uncompared with other people's. At any rate, he'd seen something so horrible that he'd turned to grasp death as a friend. Thank God for words—I shall never grouse at a grousing farmer again.

I must have green fingers. Twice in ten days have I attended the birth of twins. This morning's effort took place in an ancient farmhouse. Its heavy oak door, studded with great nails, is usually sported but it swung open easily and I went in through the cobbled entrance hall and vast flagged kitchen up the stairs to the patient's room. The view from this window is unbelievably like a stage backcloth. Running from right to centre is a low stone wall, back centre is a duck-pond with real ducks, and in the left foreground there is a cowshed with a thatched roof and four byres each surmounted by the name of its occupant done in white paint a long time ago, thus: MYSTRY, MIRTLE, CANDY, CURLEY. "Almost singing themselves they run," I quoted to myself, "let's see what we can do." The first couplet came to me as I was unpacking the midder bag:

> Mystery, Myrtle, Candy and Curly,
> You and I have to get up too early.

Not bad for a start. Now what do we want? Chloroform? M'yes. Perineal needle and sutures? I hope not. Forceps? I doubt it, but you never know.

> Mystery, Myrtle, Curly and Candy,
> We'd better have the forceps boiled and handy.

There followed an interval during which I received Henry, a vigorous seven-pounder, yelling and kicking lustily. Waiting for Richard, who had elected to present by the breech, the divine afflatus came upon me once more:

> Candy, Curly, Mystery, Myrtle,
> Henry was a vertex but Dick's turned turtle.

Blushing modestly, I ruptured Richard's membranes for him and he made a precipitate entrance into this world, his opinion of which he rightly expressed in no uncertain fashion. I tied his cord, the tea was brought in, and, raising my cup, I composed and sang the following beautiful quatrain:

> Curly, Candy, Myrtle and Mystery,
> You and I are living through too much history.
> Let's hope that the twins will enjoy a calm
> And prosperous partnership on this farm.

Exhausted, but with a pleasant sense of satisfaction at having helped two young blades to grow where none grew before, I picked up my bag and went home to breakfast.

* * *

Biologists and surgeons meet on common ground in knowing very little about burns. The surgeon has his problem in the bag in all senses except the right one; but the biologist has a cast-iron excuse for his ignorance, for getting burnt is a complete biological novelty. Animals simply don't get burnt—there isn't any fire or hot water to burn them with. But while parasitic affections have a history dating from the beginning of biological time (say 2,000,000,000 years), getting burnt as a significant phenomenon dates from the Industrial Revolution. I'm not suggesting that the Great Fire of London was merely a flash in the pan, and one of my colleagues points out that 15th century cannons undoubtedly caused severe burns in those who had the temerity to discharge them. But that's not the point. Evolution just isn't fast enough to build up a specific mechanism of defence on the experience of a few hundred years' occasional exposure to undue warmth. The reflex to avoid burns is not specific; unlike the blink-reflex and the loud-noise reflex it has to be *learnt*, and it's not in any way different from the reflex by which we protect ourselves from any bad thing—e.g., a circular saw. The flooding of tissues with serum after a burn is not comparable to a delicate, specific mechanism of defence like antibody formation or the osteoblast reaction that follows a fracture.

* * *

The effect of prolonged and intense cold on a fat middle-aged body is more distressing than is commonly imagined. To stand for hours on the deck of a small vessel in an east wind requires fortitude—if not courage—for the process of inevitable, gradual, painful numbing leaves the mind, like that of Dr. Johnson's condemned criminal, vastly clear. Any amount of protective clothing—sea boots, sea-boot stockings, scarves, duffle coat and balaclava helmets—offers as little resistance as a snowflake to fire. At first the pain in the feet is a drawn-out agony; then the knees hurt and the front

of the thighs. In my experience the last and curiously painful portions of the body to suffer are the nipples and the external genitals. The two supposedly exogenous zones behave differently. The nipples become erect but the testicles seem anxious to escape into the warmth of the inguinal canals and the penis assumes clitoridean proportions. On our ships there were no chart-rooms, no hot coffee and no Nelson's Blood.

* * *

No matter how much else I may have to omit in a paper, I always read the obituaries, whether it be the *Lancet* or the *Times*. Pace the psychologists, there is no morbid or sadistic reason for this habit, nor is it even a manifestation of an inferiority complex. If I were pushed for an explanation I should probably say that, for a busy man, it is one of the simplest ways of learning the history of the previous few decades. The reference in the obituary of Graham Steell to his aphorisms and the examples therein quoted found me in a reminiscent mood. The reference to the assessment of the correct length of the stethoscope in terms of the jumping distance of the flea pleased me, for though I never met Graham Steell this is a piece of advice which I always hand on to my students when they enter on their clinical period. But the age of aphorisms seems to have passed. I periodically study the various hospital journals for examples of "sayings of the great." These are varied enough but most lack the pith, the originality and the felicity of phrasing of the sayings of the great clinicians of former generations. To take syphilis, for example, how could the ætiology be more neatly summarised than "Bacchus, Venus and Mars," or how could the whole gamut of this disease be better put than "a night with Venus and a lifetime with Mercury"? What modern obstetrician has improved on "sow the wind and reap the whirlwind"? That worthy north-country surgeon, Rutherford Morison, pilloried the tendency of medical students to be always on the lookout for rare diseases in the following words (his distinguished pupil now at Hammersmith will correct me if I am wrong): "In this country if you see a bird on the housetop it *may* be a canary but it is much more likely to be a sparrow." Few dressers who passed through his hands ever forgot this simple truth so pithily expressed. The causes of the decline in the quantity and quality of aphorisms are complex, but two predominate: (1) this "scientific" age is suspicious of any statement unless it is amplified by pages of technical jargon and "proof"; (2) (whisper this not in Gath) the intellectual background of our teachers is rapidly declining, certainly so far as knowledge of the humanities is concerned. A few are still able to illustrate their lectures by appropriate quotations from the Bible, Shakespeare or Voltaire, but this attribute is so rare these days that the solitary member of the hospital staff who is able to practise it is looked on by his students as rather an oddity. Other days, other customs, but many customs are discarded not because they are bad or have been improved on but simply because they are the customs of other days. Our pathologist and I decided the other day that we were the last of the Puritans. Certainly I am old-fashioned enough to believe that, while it may not be impossible, it is certainly extremely difficult to be a good doctor without the ability to express oneself in the King's English.

* * *

All this talk about sex instruction to children seems silly to one who was brought up in a family where, for instance, the new curate was asked if he agreed with Gilbert White that larks copulate on the wing; where at nursery tea a younger brother was jeered at when he said he'd seen a thrush mating with a blackbird, because he had obviously mistaken the spotted breast of a hen blackbird for a thrush; where one of the family jokes was that the stud fees of a buck rabbit that belonged to the washerwoman were recorded in the laundry book, sandwiched between "Hd'ks, 24, 2*s*." and "Shirts, 7, 2*s*. 4*d*.," as "Rabbit, 3 vis, 1*s*. 6*d*."; where cross-pollination, and the breeding of hawk-moths, mice and the like were regarded as the most interesting things in the world, as indeed they are. If there is a mystery about the macroscopic acts that lead to fecundation it is the purposeful creation of the adult, who seeks to protect his pleasures and his germ-plasm, the bribe and the reality, from the surging host of adolescents. Hence the sexual taboos and codes. Microscopically I suppose it is true that the strange primordial ceremony of initiation, but feebly glimpsed by human eye, where priestly protoplasm, genes and thurifers, genules and acolytes, move in solemn order before the high altar, is in fact, save for the source of life itself, the supreme mystery.

* * *

The other day my eye caught the following announcement in the "Births" column of our local paper, the *Erewhon Gazette and District Advertiser*:

At X Nursing Home, Erewhon, to the wife of ——, a beautiful son; thanks to doctor, nurse and Muriel. (No visitors.)

It sounds rather like infamous conduct in a professional respect; but what was Muriel doing in that galère?

Public Health

Intestinal Infections in War-time

In 1929 there were 112 deaths from the enterics in England and Wales, exactly a tenth of the number in 1916, and by far the fewest in any year of our history. In 1940 the number was 135, the second lowest, and though that for 1941 will not be quite so favourable it will be very low. The notifications of the combined group of typhoid and paratyphoids in the three years 1938–40 were 1322, 1479 and 2833. In 1941, for the first time in England and Wales, typhoid was officially separated from the paratyphoids, so we shall be in a better position to follow the course of these diseases. Typhoid is slowly becoming extinct in Britain and the war has not interfered with its downward course. It was feared that it might do so because of the damage to waterworks and pipings from air-raids, for typhoid on a big scale is always connected with polluted water; but though the damage to the supply system in 1940 and 1941 was at least as serious as we expected, in no place did it give rise to any outbreak of typhoid. On the other hand, outbreaks of paratyphoid B have been unusually numerous and extensive since the war started, though fortunately of trivial fatality. Most of the outbreaks have been spread by artificial cream. Food-poisoning outbreaks have not been over frequent and most of them have been small, with little or no fatality. Several of the outbreaks have been due to *Staphylococcus aureus*, others to various organisms not formerly suspected of causing poisoning, and fewer than usual to the various salmonellas. In Liverpool in 1940 there were 40 notifications of paratyphoid and 7 of typhoid with no fatality; in Carlisle, 15 paratyphoids and no typhoid, also without fatality; in Edmonton 26 notifications, not differentiated, with no fatality; in East Ham 7 paratyphoids with no fatality; in Ilford 28 notifications, not differentiated, with one death. These are samples taken at random. In 1941 there were extensive epidemics of paratyphoid in Bristol and Liverpool areas, both spread by artificial cream and both with fatalities below 1% of recognised cases.

On the unfavourable side is an increasing prevalence of bacillary dysenteries and a brisk rise in infantile diarrhœa. The dysenteries which have furnished positive bacteriological findings have been mainly of the Flexner and Sonne type, but among some prisoners of war cases of the much more formidable Shiga type have been detected. Infantile diarrhœa is gauged by the returns of deaths from "infective enteritis or diarrhœa under two years of age." Many of these infant deaths are not due to infective enteritis. In past years, when nearly 10% of all infants born died from diarrhœa, infective enteritis swamped deaths from other digestive disturbances, but in years and places where few infants die of diarrhœa the causes of the fatalities are various. The rise in diarrhœa seen in 1940 and 1941 has slackened this year.

Since the outbreak of war there has been an increase of about 25% in fatal peptic ulcer, but a fall of about 20% in fatal appendicitis. Several outbreaks of trichiniasis, some extensive but without fatality, were reported in 1940 and 1941, due to eating uncooked or partially cooked sausage meat. This disease was probably commoner in the past than the records show, for minor outbreaks are easily missed; an outbreak of some importance occurred in Wilts about five years ago. Slight infestations of swine with trichinella are not easy to detect by inspection, but since the worm is destroyed by thorough cooking the disease in man can be controlled.

From the Annual Reports

In his 1940 report for Hornsey, Dr. R. P. Garrow says that the intense cold of the winter quarter, causing a high mortality among the very old and the very young, together with deaths caused by enemy action, account for the sharp rise in the general death-rate from 11·56 in 1939 to 15·16 in 1940, and, inferentially, the rise in infantile mortality from 27 to 45. Otherwise the year's health record was very favourable. Direct enemy action caused many deaths in 1940 very unevenly distributed, and this is one reason why the death-rates of that year show such great local variation. The severe winter was common to the whole country, but its influence on the death-rate varied according to the composition of the population. Unlike that from enemy action, the mortality due to the weather would level out on standardisation. Accepting that man is mortal and that his vitality declines as he grows older, we must accept also that the sudden termination of his life from the vagaries of Nature which we cannot control is a natural phenomenon, even if we attribute the end to such pathological conditions as bronchitis or heart disease. We are not, however, prepared to accept cold as a natural cause of death in the young, for this can be avoided. So though we accept the fact that juvenile mortality does rise in cold winters, we are dissatisfied with the explanation.

Except for the rises in tuberculosis and of infantile mortality, 1940 was a favourable year for health, unmarked by any high prevalence of serious disease. Since tuberculosis and infantile mortalities are the two most sensitive indices of the nutrition of the people they call for special attention. If, in fact, we are being fed below par we should not obtain any tangible evidence of it in the general population for years to come, but infants and the tuberculous react immediately. On the other hand, we must take account of other factors which might act adversely on these two sections of the population and not assume that the rises in tuberculous and infantile mortalities are necessarily caused by malnutrition. Rationing has caused a more even distribution of food than this country has ever experienced, so even if the amount available per head were less than necessary for perfect health, the bulk results would show a diminution of ill health attributed to ill nourishment. But the distribution of food is not quite even, for sometimes the very poor cannot afford their allotted rations and the wealthy can obtain an unfair share of unrationed goods. If therefore the enhanced tuberculosis and infantile mortalities were due to ill feeding consequent on food shortage, they should be distributed according to the wealth or otherwise of the various population units. Let us take a batch of annual reports at random and see what they will tell us.

Hornsey: rise in infantile mortality from 27·25 to 49·3; lowest number of deaths from tuberculosis on record.

East Ham: infantile mortality level at 41; tuberculosis deaths rose from 31 to 69; tuberculosis mortality rose from 1·1 to 1·5.

Hammersmith: infantile mortality rose from 43 to 51; tuberculosis mortality rose from 0·8 to 1·1.

St. Marylebone: infantile mortality rose from 60·6 to 67·1; "no evidence of excessive mortality from tuberculosis."

East Suffolk: infantile mortality 44·3 against quinquennial average of 43·4; tuberculosis mortality rose from 0·45 to 0·48.

Shrewsbury: infantile mortality fell from 0·42 to 0·31.

Leamington: infantile mortality rose from 50 to 55; tuberculosis mortality fell from 0·54 to 0·42.

Newport: infantile mortality rose from 53·6 to 79·7; tuberculosis mortality rose from 0·73 to 0·98.

Salford: infantile mortality rose from 69 to 76; tuberculosis mortality (pulmonary only) rose from 0·9 to 1·1.

Tunbridge Wells: Tuberculosis mortality fell from 0·38 to 0·37, the lowest rate recorded.

These excerpts suggest that rationing has had nothing to do with the rise in infantile mortality, but may have had a slight adverse effect on tuberculosis.

Several medical officers express disappointment at the continued high prevalence of diphtheria in spite of the immunisation campaign, and more are surprised that evacuation did not lead to extensive epidemics in reception areas; but immunisation is still too limited and in general of too short duration to affect the general situation, whereas in many reception areas the work done in years past might have been sufficient to prevent outbreaks of diphtheria from assuming serious proportions. Some reduction of the fatality of the disease has occurred in the past few years.

From the school reports the matters of chief interest are: increase in the numbers of children suffering from pulmonary tuberculosis; reduction in numbers with organic heart disease; and considerable reduction in the numbers submitted to operation for tonsils and adenoids. The first is probably due mainly, if not exclusively, to better detection; the last to disorganisation of school work and the break-up of families; but the reduction in heart disease seems to be real.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS, M.P.

THE house reassembled after the Easter recess to face the largest Budget ever presented in this country. This budget directs colossal sums to the war effort and limits more and more personal expenditure on everything but strict necessities. Beer, wines and spirits, tobacco and entertainments, lipstick and hairdressing are to be more expensive, indeed practically everything except food and utility clothing. The Press have baptised it the Austerity budget, but it is doubtful whether even now it is as severe as the name suggests; it does indicate the direction of policy. Emphasis on saving, restriction of minor luxuries, pressure for more production and longer hours of work, however willingly accepted—of the willingness there is no doubt—all throw greater strain on the individual. We have less time to do things and more things to do. We are, for example, a dirtier people than we were in 1939—the statistics of scabies and of pediculosis show this clearly. How far is this related to the greater pressure on our lives? And how far is the increased incidence of tuberculosis due to the same cause?

When Mr. Bevin announced in answer to a question that he was now able to revoke an order he made allowing men, women and young persons in the potteries to work longer hours than those permitted by the Factory Acts, Mr. Graham White asked whether the views of the Industrial Health Research Board on the extension of hours in the pottery and textile trades had been sought before the order was framed. The answer was no, but it is clearly a mistake not to use the advice of the board when framing orders. They understand what strain the human organism can bear. When Mr. Bevin brushes aside medical advice, saying, "We do not rely too much on experts. We have to apply some common sense," he gives himself, and the nation, an unnecessary handicap. New weapons in war arise out of scientific work and so should new weapons of administration.

It is hoped to have a debate on health questions at an early date—one on hospitals will have taken place by the time these notes are in print. This health debate has been postponed several times already but it is hoped that no further postponement will take place. Expert knowledge on health matters is urgently needed in our national affairs. The Army, Navy and Air Force authorities lay stress on the application of scientific knowledge to the protection of health. But in industry we are only half-heartedly using scientific knowledge. Over-long hours and bad conditions have already been shown to be ineffective as stimulants to production. To hope that common sense apart from expert knowledge can decide these matters in the future endangers our productive effort.

FROM THE PRESS GALLERY

Priority Milk

In the House of Lords on April 15 Lord ARNOLD called attention to the cumbersome procedure which invalids have to follow to obtain their supply of priority milk. The doctor, the patient, the food office, and the dairyman all had to exchange forms and when a priority certificate was issued it lasted only for one month, then the whole process had to be gone through afresh. Most of the patients eligible for extra milk needed it for longer than one month, and he suggested that doctors should have power to give a certificate for six months.

Lord WOOLTON said that because the supply of milk varied with the season, but the demand did not, the Food Ministry had found it necessary to institute priorities so that each person could get the milk he needed. The determination of these needs was not a matter for amateurs; the Medical Research Council had appointed a special committee to advise him how to allocate our supplies. He had given priority claims to children, nursing mothers and invalids, and for all those classes he had prescribed the exact quantities that his medical advisers considered necessary. Even in times of the greatest stringency the invalids had been able to get their milk. The machinery for granting priorities was devised in consultation between the Medical Research Council, the British Medical Association and the Food Ministry officials. He believed that it was a machinery that safeguarded the health of the patient, and safeguarded the doctor from the pressure which might be brought to bear upon him by people who felt that they would be better if they had a greater share of this food. He was indebted to the medical profession for the care with which granted they had these certificates. In the opinion of the medical profession it was unnecessary to give a certificate in the first instance for longer than one month, but there were diseases where milk had to be given continuously, and for these the certificate was given for a longer period.

Family Allowances

In the House of Commons on April 16, Sir KINGSLEY WOOD, the Chancellor of the Exchequer, winding up the debate on the Budget resolutions, said that the investigation into family allowances which he had ordered was now nearing completion and he hoped to give the House shortly some information of figures as to the costs in a white paper.

QUESTION TIME

Juvenile Hours of Work

Mr. A. HOLLINS asked the Minister of Labour whether he could now announce the decision about the continuance of his order of Dec. 23, 1941, on working hours in the potteries.—Mr. E. BEVIN: The order was made to enable men, women and young persons remaining in the industry to work longer hours than those normally permissible under the Factory Acts in order to maintain the necessary output with the reduced labour force; and as I naturally do not wish to authorise such relaxations of the ordinary law to a greater extent than necessary I have had the position under close review. It now appears that the industry has been able to adjust itself to the new situation without a general resort to overtime, and in view of altered conditions in the industry itself I have come to the conclusion that a general order of that kind is no longer necessary or appropriate. I am therefore revoking it as from May 3, but I should like to make it clear that some relaxations of the Factory Acts may still prove necessary in special cases in order to secure the output required.

Mr. K. LINDSAY asked whether there was any chance of doing the same thing in the cotton industry.—Mr. BEVIN: Not until I have made the necessary adjustments.

Mr. GRAHAM WHITE asked if the views of the Industrial Health Research Board, on the extension of hours of employment of young persons, were ascertained before the orders dealing with hours in the pottery and textile trades were made.—Mr. BEVIN said No, the function of the board is to advise upon or carry out suggested schemes of scientific research on the basis of actual conditions and of a kind which may be expected to occupy a long period of time. In the cases referred to I had to decide quickly whether war requirements necessitated a temporary change of conditions. In the cotton industry I am arranging for some inquiries in Lancashire, through the factory inspectors, as to whether any general signs of fatigue were manifesting themselves among the juveniles as a result of the longer hours in cotton-spinning mills.—Mr. T. E. HARVEY: Will that inquiry include medical advice?—Mr. BEVIN: We do not rely too much on experts; we have to apply common sense. (Laughter.)

National Loaf

Sir ERNEST GRAHAM-LITTLE asked the parliamentary secretary to the Ministry of Food whether the stocks of white flour held at present by the Government were of 70% extraction or higher and were fortified with any additions; whether it was intended that the national wheatmeal loaf to be shortly exclusively supplied was to consist as to 25% of this lower extraction flour; whether he could give any approximate date when the loaf of 85% unmixed with white flour might be expected on sale; and whether it would be distinguishable from the composite loaf immediately provided.—Major G. LLOYD GEORGE replied: Stocks of white flour consist in part of home-milled flour of 75% extraction, and in part of imported flour of similar quality. In both cases the flour is fortified with vitamin B_1. In arranging for the use of these white flour stocks the main consideration has been to avoid loss by deterioration. Bakers have, therefore, been permitted to use up to 25% white flour with national wheatmeal in making the national loaf. The date when the loaf will be made entirely from 85% wheatmeal will vary in different areas, depending on the quantity of white flour in those areas and the necessity for its early use. It is not intended to instruct bakers to distinguish in any way the national loaf carrying the authorised admixture of white flour from that made entirely from 85% wheatmeal, but the latter will, of course, be slightly darker in colour.

Addition of Calcium to Flour

Sir ERNEST GRAHAM-LITTLE asked Major Lloyd George whether it was his intention to add calcium to the flour for national bread; and if so, from what date, what salt was to be used and in what quantity.—Major LLOYD GEORGE replied: Yes. The decision was originally announced in July, 1940, but the supply position of such foods as milk and cheese has been better, and the national intake of calcium has accordingly been greater, than was then anticipated. In view, however, of the changed outlook owing to the reduction of imports, the Minister of Food, after consultation with the Minister of Health, has decided to arrange for the addition of 7 oz. of calcium carbonate (creta preparata) to each 280 lb. sack of flour. This addition will proceed district by district throughout the country until all flour on sale will be so treated.

Sir H. MORRIS-JONES: Is not this a fad on the part of a few scientific advisers, and is it not against the experience of most experienced general practitioners? Why should every man, woman, and child have forced on them calcium which is likely to be injurious?—Major LLOYD GEORGE: That, of course, is a matter of opinion. We are advised that it is essential to increase the intake of calcium, and it is not the advice of faddists but of eminent medical men. The decision was made in consultation with the Minister of Health.

Wholemeal Bread

Sir ERNEST GRAHAM-LITTLE asked Major Lloyd George whether it would be possible, and under what conditions, for persons who preferred to eat bread prepared from the whole grain, without any admixtures, to obtain such bread: and whether vendors providing this bread would be penalised if they did not, at the same time, stock national bread.—Major LLOYD GEORGE replied: There is no restriction on the manufacture of bread made from wholemeal for those persons who prefer it. Where such bread is sold at prices not exceeding the maxima in the Bread (Control and Maximum Prices) Order, vendors are not required to stock national bread. If higher prices than 2*d.* per lb. or 2½*d.* per 1 lb. loaf are asked, the seller must have available national bread at the time of such sale.

Medical Man Power

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health how many registered medical practitioners were at present working for the Emergency Medical Service and in first-aid posts; how many of these were of military age and could be employed as medical officers to the armed services; and whether, as the estimate made at the outbreak of war of the probable requirements of the EMS had so far proved too large, a transfer of medical personnel would now be made from the EMS and first-aid services to the armed services.—Mr. E. BROWN replied: The number of doctors enrolled in the EMS on March 31, including those on a whole-time or part-time salary but excluding those who attend on a sessional basis when required, was 1775, and the number of doctors in charge of first-aid posts on Dec. 31, 1941, was 2587. All those liable for military service come under review by the Central Medical War Committee and its local committees, and the decision whether a doctor is to be recruited depends on the needs of the hospital or other service in which he is engaged. A percentage reduction in whole-time medical staffs of hospitals is being carried out on the recommendation of the Medical Personnel (Priority) Committee and the reduced establishments will be no more than are required to treat casualties from enemy action on the scale actually experienced and to provide for the various other types of patients now included in the Emergency Hospital Scheme. The doctors in the first-aid services are almost invariably engaged also in general

practice or other medical work and their availability for the Forces is judged on the needs of that other work rather than on their first-aid commitments.

Admission to Nursing Register

Captain W. F. STRICKLAND asked the Minister whether, in view of the urgent national need, he would introduce any necessary legislation, or take any other emergency measures, to enable retired fully-trained nurses, not previously registered under the Nurses Registration Act, 1919, to become so registered after recommendation by the medical profession without the long delay and inconvenience of a period of fresh qualification.—Mr. BROWN replied: Legislation would be required for the purpose of varying the conditions on which nurses can be admitted to the register. I do not think I should be justified in introducing such legislation.

Population Estimates

Sir FRANCIS FREMANTLE asked the Minister what were the crude birth- and death-rates for England and Wales for 1941.—Mr. BROWN replied: the crude live birth- and death-rates in question are 14·2 and 12·9 per 1000 population respectively.

Sir F. FREMANTLE: What will be the estimated population of England and Wales in 40 years' and in 100 years' time if birth- and death-rates continue at present levels?—Mr. BROWN: A memorandum has been prepared by the Registrar-General's department with respect to the estimation of the future population of this country. In answer to further questions Mr. BROWN added that when the report was printed some time ago the memorandum was not printed with it. He would consider the best way of making it generally available, as the subject was important.

Rations in Enemy-occupied Countries

In answer to a question Mr. D. M. FOOT, parliamentary secretary to the Ministry for Economic Warfare, said that the weekly rations for a normal consumer in Belgium are, bread, 55 oz.; meat, 8½ oz.; fats, 3½ oz.; potatoes, 123 oz.; sugar, 8 oz. In Greece the weekly bread ration is 37 oz. There is no fixed ration for other foodstuffs, which are exceedingly scarce. In Poland there is no uniform rationing scheme, since rations vary from place to place, and there is marked discrimination between Germans, Poles, and Jews. But the latest figures available for Poles in Warsaw are, bread, 39 oz.; meat, 1½ oz.; fats, 1 oz.; and for Poles in Cracow, bread, 52 oz.; meat, 3½ oz.; fats, 1 oz.; sugar, 4½ oz.; groats, 5½ oz. In none of these three countries are the published rations always fully available.

Food-supplies for Greece

Seven thousand tons of wheat, which had been made available by H.M. Government and paid for by the Greek Government reached Piraeus in the steamship *Radmanso* during the third week in March. I have not yet received a report as to the distribution of this cargo among the Greek people. (Mr. FOOT replying to Sir T. MOORE.)

Cause and Prevention of Scabies

Mr. C. G. AMMON asked the Minister of Health what was the cause of the increase of scabies among the civil population; and what steps were being taken as preventive.—Mr. BROWN replied: The causes of the increase in scabies are not fully understood. Special war-time conditions undoubtedly conduce to the spread of the disease but a steady increase in incidence was noted for some years before 1939. Research for which I arranged over a year ago is now being continued by the Medical Research Council and curative and preventive measures based on this research will, I hope, help to reduce the incidence. Local authorities, under an order made in October last, received additional powers the object of which was to secure the early ascertainment and treatment of cases of scabies which would otherwise have gone undetected and would have acted as reservoirs for the parasite causing the disease.

Scabies in the Army

Mr. F. J. BELLENGER asked the Under Secretary of State for War what arrangements existed, in view of the prevalence of scabies, to cleanse and sterilise blankets periodically throughout the service.—Mr. E. D. SANDYS replied: All army blankets are disinfected every six months and scabies is not confined to the Army. The incidence has been increasing among the civilian population. More frequent disinfection of blankets has been tried but it has not reduced the incidence of scabies. I too am anxious to reduce the incidence of scabies, but I am satisfied that it is not caused by the state of the blankets. I understand that it is usually spread through bodily contact and that infection from blankets only accounts for a very small proportion of cases.

Distribution and Consumption of Wood Alcohol

Colonel ARTHUR EVANS and Sir LEONARD LYLE asked the Home Secretary what steps he was taking to deal with the growing danger to public health through the illicit distribution in labelled bottles carrying well-known trade names of wood alcohol, or similar spirit substitute.—Mr. H. MORRISON replied: I have been in consultation with the Board of Customs and Excise and the Commissioner for Police, and I find that there has been one case in which a workman stole some wood alcohol and used it to strengthen home-made wines which he produced on a small scale. He was convicted and sent to prison. There have been stories in the Press suggesting the prevalence of such practices but there is no evidence so far forthcoming to support these allegations.

Dispensers in the Forces

Mr. BEVIN informed Mr. T. Kennedy that only suitably qualified men were posted to the Forces by his department for service as dispensers, and the demands from the Services for such men had been substantially met. He was informed that it was not the practice of the Services to employ unqualified men in the Service trade of dispenser.

Sir IRVING ALBERY: Is the Minister aware that in the RAF women are being trained to fill these positions?—Mr. BEVIN: I assume that if they are trained and pass a certain standard, they become qualified.

Rationing of Pharmaceutical Compounds

Mr. W. S. LIDDALL asked the Minister of Supply whether he was prepared to introduce a rationing scheme for the materials for pharmaceutical compounds, having regard to the shortage of certain of such materials for essential purposes, at a time when they were being used largely for the purpose of manufacturing pre-packed drugs which were sold in chain stores.—Mr. CHARLES PEAT replied: Control is already exercised over the distribution to manufacturers or wholesalers of some of the materials used in pharmaceutical compounds, and the Minister is considering, in consultation with the Minister of Health, whether control should be extended to certain other materials.

Public Health Broadcasts

Mr. H. BROOKE asked the Minister of Health whether, in view of the importance of maintaining high standards of national health in war-time, he would ask the BBC to arrange more frequently for popular talks on health subjects.—Mr. BROWN replied: The BBC has arranged to broadcast a new series of weekly health talks every Monday evening beginning on April 13. This series will be in addition to the Health Magazine which is broadcast every Friday morning, and on which the BBC keeps in constant touch with my department.

BP CHANGES TO SAVE ALCOHOL

IN the fifth addendum to the BP, which will shortly be published, a number of modifications have been made to economise in alcohol. The main one is the introduction of eleven concentrated tinctures. Of these, the following ten are each four times the strength of the ordinary BP tincture (doses in parentheses): concentrated tincture of orange (min. 8–15), capsicum (min. 1–4), lemon (min. 8–15), quassia (min. 8–15) and tolu (min. 8–15); concentrated compound tincture of cardamom (min. 8–15), cinchona (min. 8–15) and gentian (min. 8–15); concentrated ethereal tincture of lobelia (min. 1¼–4); and concentrated ammoniated tincture of valerian (min. 8–15). On the other hand, the new concentrated camphorated tincture of opium (min. 4–8) is roughly eight times the strength of the ordinary tinct. opii camph., and min. 8 of it contains about gr. 1/30 of morphine. In addition to these tinctures the addendum makes official the liquid extracts of quillaia (min. 1¼–3) and of squill (min. 2–8) of the BPC, and emulsions of chloroform (min. 5–30) and of peppermint (min. 5–30) which are also to all intents the same as those of the BPC. Ext. scill. liq. is roughly ten times the strength of tinct. scillæ. There is a new concentrated solution of ethyl nitrite (min. 2–8) which is about eight times the strength of spirit of nitrous ether, and a new aromatic solution of ammonia (min. 15–60) which is nearly the same as that of the BPC and equivalent to sp. ammon. aromat. in content of ammonia and ammonium carbonate. The monograph on menthol has been revised so as to include the synthetic product. There is a useful cumulative index to the five addenda.

Letters to the Editor

WHAT ARE THE FACTS?

SIR,—Some years ago a tuberculous patient consulted me on a family problem: "Should I agree to my only child becoming a nurse? You know my history and the care we have always taken to build up the girl's health. Is it all right, the hard work and all that?" As the girl was barely 18 I advised a year's delay and then, if the desire was maintained, careful choice of a training school. Four years later came the final state examination and X went to it from a heavy night on duty. She failed, and explained to her parents, she knew it must be so she "just couldn't think." She was greatly cast down by her failure and later the matron, concerned at her appearance, arranged to put forward her summer holiday. She joined her mother at a railway terminus, had a violent hæmoptysis before reaching the train, and was dead within a month.

I hoped this story was atypical but medical colleagues in sanatorium work did not agree. One of them who receives the women patients of a large industrial area said, frankly "too many young nurses come here as patients; it's disquieting." Since then inquiries have been held as to employment incidence as regards tuberculosis but figures as to nursing are not forthcoming. Why? Does the shortage of nurses prohibit the disclosure of facts? The toll of tuberculosis is highest and most persistent among young women at the age of probationer nurses. Can employing bodies such as county councils give assurance to the medical profession and the public that there is *no* added risk in nursing as compared with other employments? Public money and effort are being expended to popularise nursing. This would be more effectual if lurking apprehensions about the conditions awaiting recruits were first cleared away. Should this not be possible, other questions arise. What lessening of undue strain can be arranged? Perhaps the story with which this letter starts suggests one evil to be eliminated. Serial X-ray examination of nurses should be compulsory and much fuller recognition is needed of the fact that study for examinations is incompatible with full-time arduous employment.

Establishment of public confidence that nursing offers as reasonable terms of service as other reserved occupations would surely do more to help recruitment than anything else.

Moor Park. ESTHER CARLING.

FRACTURE OF THE FEMORAL NECK

SIR,—From Mr. Haydon-Baillie's letter of April 11 I conclude that he can have had little practical experience with the abduction treatment since he speaks of it as an "ambulatory device." In his opinion "the senile condition of most of the sufferers" would prevent its application, because of the tendency of this class of patients to "break up as the result of such an injury or being put to bed or both renders the patient unable to avail himself of the treatment." He implies therefore that the relief of discomfort "and the avoidance of the liability to fatal hypostatic pulmonary congestion and bedsores" rather than the treatment of the fracture should be the first consideration.

Paradoxical as it may seem these are the very arguments that have been urged to support positive treatment. The patient lies in an inclined plane and is turned to the ventral posture systematically. It may be emphasised that the "Whitman plaster" is not a splint for the fracture but is a means of supporting the limb in the attitude that makes the anatomical splinting effective, thus in its application the first concern is the comfort of the patient. In my experience this treatment, which relieves pain, permits changes of attitude and transportation to the open air, and which above all presents a prospect of recovery as contrasted with inevitable disability is the most conservative treatment, even of the aged. In fact contrary to the prevailing opinion these patients are very amenable to "bed treatment," and their physical condition often improves during the period of enforced rest. Of 441 cases of medial fracture treated by this method, reported by several observers, 126 were over 70 years of age, 57 over 80 and one successful case has been reported at 102. I conclude that the evidence at command justifies the statement, that the abduction method has made treatment in accord with surgical principles practicable and effective in the great majority of the cases.

The Athenæum. ROYAL WHITMAN.

ANOXÆMIA AS A TEST FOR CORONARY DISEASE

SIR,—To your short leader on coronary disease (March 28, p. 388), dealing with anoxæmia as a diagnostic test, may I add a cautionary tale for anæsthetists, and an illustration of the danger of inducing anoxæmia as a test.

I gave a nitrous-oxide and oxygen anæsthetic to a woman of 55 for the removal of two teeth. Early induction was with 95% nitrous oxide and the rest of the anæsthesia, lasting about three minutes, was with 90% nitrous oxide and 10% oxygen, given with a McKesson apparatus. The extraction was effected easily and gently; at no time was there cyanosis, jactitation, struggling or excitement. Return to consciousness was moderately rapid but was accompanied by dyspnœa, mid-chest pain and pallor. These symptoms persisted and three days later the diagnosis of coronary occlusion was confirmed by an electrocardiograph. Recovery proceeded uneventfully.

Upon inquiry it was learned that this patient had considerable hyperpiesia (BP 225/120, 230/140) and arteriosclerotic retinal vessels. There was no previous history of anginal pain. As her hæmoglobin content was normal, the absence of cyanosis is positive proof of the limited degree of anoxæmia. Excluding accidental association, and factors such as excitement and shock for which there appeared to be little evidence, it seems evident that the sudden disaster was due to the anoxæmia of nitrous-oxide anæsthesia acting on an already sclerotic coronary vessel. This case also illustrates the necessity for clinical interrogation and examination before anæsthesia, even for so-called minor anæsthetics.

London, N.W.8. S. CHARLES LEWSEN.

CASE HISTORY IN DIAGNOSIS

SIR,—I find it difficult to visualise the state of perfection insisted on by Dr. Plesch in your issue of Nov. 15, 1941 (p. 623); for my many medical friends are but human. And what exactly does he mean when he says "If we do not discuss his case with the patient we bring medicine to the level of veterinary medicine"? That one cannot converse with an animal is of course true but he goes on to point out the importance of "inspection" or in other words the faculty of observing closely and accurately. This power of observation is of even greater importance to the veterinary clinician than to his opposite number in human medicine because he cannot get a case history direct from his patient and must therefore rely more on observation and deduction. In the case of children I presume Dr. Plesch in addition to "inspection" obtains his information from the parent or whoever is in charge, which is exactly what we endeavour to do in veterinary medicine, and I venture to think he would find getting at the truth by "clever" cross-examination (let alone psycho-analysis) of a British farmer about his stock not so easy. At all events he could have made his points clear without disparaging veterinary medicine which is a branch of our mutual mother science.

Veterinary Laboratory, Entebbe. J. CARMICHAEL.

RESUSCITATION IN SHOCK

SIR,—The recent correspondence on shock seems to show that a little interest is at last being taken in this important subject. Dr. Dunlop and Mr. Paramore both criticise the modern tendency to indiscriminate blood-transfusion. I absolutely agree with them. In the *Lancet* of Jan. 2, 1937 (p. 6), I published some observations on blood changes after operations and came to certain conclusions, some of which I should like to quote. "The best method of fluid replacement if the oral route is contra-indicated is per rectum. . . . Since pulmonary œdema may result from abnormally low percentage of protein in the plasma, and since intravenous fluids tend to lower this percentage, the level of the plasma protein should be ascertained before giving fluid intravenously. . . . Owing to the danger from protein loss, emergency treatment of postoperative shock should preferably consist in intravenous infusion of plasma. . . . Blood-

transfusion for shock and burns is contra-indicated in the absence of anæmia or massive hæmorrhage." Since then I have experienced nothing to contradict these conclusions and I would like to emphasise that before intravenous therapy is started an estimation should be made of the patient's hæmoglobin and serum proteins. The appropriate treatment can then be summed up in the following table:

Hæmoglobin	Serum protein	
	Increased or normal	Reduced
Increased or normal	Non-colloid solution by mouth or rectum or intravenously	Serum or plasma intravenously
Reduced	Blood-transfusion	

It is high time that blind therapy with dangerous substances should be given up. Who would dare give insulin without a sugar estimation?

Queen Mary's Hospital for the East End. W. W. WALTHER.

DIAGNOSIS OF PERNICIOUS ANÆMIA

SIR,—I read Dr. Israëls's letter with particular interest for I was instrumental in introducing the technique of sternal puncture to him in the summer of 1937. I then thought I could differentiate between megaloblasts and primary erythroblasts (H. M. Turnbull's terminology; in J. M. Vaughan's "The Anæmias." London, 1936) with some certainty. In the light of fuller experience, however, I find it more and more difficult to make an absolute distinction, and I now believe that the two types of cells imperceptibly merge into each other. I therefore welcome the recent paper of Davidson, Davis and Innes (*Quart. J. Med.* 1942, **11**, 19), for their findings are in agreement with my present view—that megaloblasts, primary erythroblasts and normoblasts belong to one developmental series. It is admittedly useful to talk of "megaloblastic or erythroblastic hyperplasia" for clinicians know what the terms mean in relation to treatment, and I agree with Israëls that what is wanted is an opinion on the film as a whole, and not necessarily an elaborate differential count.

In such a controversial question each worker is entitled to his own idea of erythroblast development and it is important that he should have one, if only for the sake of coherency when demonstrating a film submitted by a clinical colleague. The hypothesis (not claimed to be original) which I find most useful is as follows. Megaloblasts are not cells of a different lineage but are primary erythroblasts of varying maturity which because of retarded development may receive hæmoglobin at an unusually early age and become thereby polychromatic or orthochromatic. This is essentially a quantitative change and all degrees of it may be seen according to the rate at which the cells develop and the stage of development at which the hold up occurs. In severe untreated pernicious anæmia the maturation of hæmocytoblasts and early primary erythroblasts is arrested and many of the nucleated cells containing hæmoglobin in the cytoplasm are therefore large with relatively immature nuclei. In certain other obscure anæmias the hold up may occur later and "megaloblasts," if present, are then smaller and more mature cells.

The thesis that the type and size of the cells undergoing premature hæmoglobinisation depend on the general degree of immaturity of the marrow receives support in the following small series of 7 cases of pseudo-aplastic anæmia (refractory anæmia of Bomford and Rhoads; *Ibid*, 1941, **10**, 175, 235). In 4 of the patients the marrow was relatively mature with late primary erythroblasts and normoblasts predominating and little or no premature hæmoglobinisation; in 2 cases the marrow was less mature and many of the primary erythroblasts of medium maturity were polychromatic or orthochromatic; in the remaining patient the predominant cell type was very immature and Ehrlich megaloblasts were conspicious.

Central Pathological Laboratory, Epsom College. J. V. DACIE.

SUBCONVULSION THERAPY

SIR,—I should like to make some observations on Dr. Frossard's letter of March 28. First, we need to define the term "subconvulsion therapy," for in the application of an alternating current of above 60 volts to a human head one of three things may happen. The patient may have a convulsion, he may lose consciousness but not have a convulsion, or he may not lose consciousness. This last in my experience is often reported as a "bang in the head." Subconvulsive therapy should be reserved for the middle zone and another term might be used for the third zone. Treatment in the second zone has been found beneficial in cases selected according to the principles named by Dr. Frossard.

Secondly, in his directions for eliciting subconvulsive shocks Dr. Frossard does not give enough information for the guidance of other workers. The type of machine used is of great importance; in the St. Bartholomew's Hospital clinic for psychological medicine, patients are rarely given more than 70 volts for 0·1 sec., and never more than 75 volts. A subconvulsive state has not been seen for a very long time. Dr. Strauss uses his own apparatus. Working with one of these models I have been able to convulse all psychotics at 80 volts. With another apparatus, at present in common use, a much greater apparent voltage is required, owing to the fact that the true voltage received by the patient varies inversely as the resistance of the patient's head, the preparation of which has a large influence on the resistance and thus on the voltage and time necessary to produce a convulsion. Furthermore, the actual "dose" needed to produce a convulsion varies significantly from patient to patient, and while 115 volts for 0·2 sec. may be satisfactory for some there is every reason to expect it to produce a convulsion in others.

Runwell Hospital. JONATHAN GOULD.

TRAUMA AND CANCER

SIR,—Mr. Warren Low's letter of Jan. 4, 1941, reminded me of a case of sarcomatous tumour of bone which seemed to be due to injury. It was during my student days. I was dressing for Tom Smith at Bart's, and this was the first occasion on which I assisted in the operating-theatre. I had to hold the leg steady while Tom Smith amputated through the thigh. The patient was a trooper in the 21st Lancers, and he had had his knee crushed while riding with his troop. I do not know how long the tumour took to develop nor can I state its size, but it turned out to be a sarcoma of the lower end of femur or head of tibia. The patient died later of secondary growth.

Sliema, Malta. E. F. N. CURREY.

Colonel A. H. BELL, president of the British Society of Dowsers, writes correcting a statement by Medicus M.P. in our issue of April 11 (p. 457) that scientific tests of dowsing for the three Services were carried out "at Mr. Maby's desire." They were, Colonel Bell assures us, made at the request of the Government department concerned.

RESTRICTIONS ON CONVALESCENCE.—Under the Defence Regulations some areas on the coast of eastern and south-eastern England have once more been closed to all visitors, and the ban includes both patients and visitors at convalescent homes, nursing-homes and other medical institutions; exceptions will only be made for patients admitted to EMS hospitals or sanatoriums in the areas. With these exceptions doctors are therefore asked not to suggest convalescence or treatment for their patients in the following areas:

The coastal strip, about five miles deep, stretching from King's Lynn to the Thames; the whole of Kent (*except* the parts within the metropolitan police district, the urban district of Orpington and the rural districts of Sevenoaks and Tonbridge, the coastal areas of Sussex from the Kentish border to Littlehampton and extending northwards to include the rural districts of Battle, Hailsham, Chanctonbury and Chailey; and the Isle of Wight.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

Obituary

HILDRED CARLILL

M.D. CAMB., F.R.C.P.

Dr. Carlill, who died at Tavistock on April 16 at the age of 60, had left London for Devon in the autumn of 1940 after retiring under the age limit from the active staff of Westminster Hospital. He had served his hospital for 22 years, the last two as senior physician. Although described by the hospital board in its leave-taking as a specialist in nerve diseases (and these had certainly been his hobby) he was always at heart a general practitioner. Before his staff appointment at Westminster he had held all, save one, of the house and special-department appointments at Guy's, besides doing jobs at various special hospitals. "I have never appreciated," he said, "the habit of mind which permits a gynæcologist to crow because correctly or not he diagnoses tabes dorsalis, or an orthopædic surgeon to admit, with some pride, that auricular fibrillation is entirely outside his professional vision. These chaps ought to put in half their annual holiday doing country practice." And so when he restarted practice himself in the depths of the country ("where, as it happened, I knew nobody") he had compensations, finding it unnecessary to wear hat or cap, doing a cisternal puncture in a centuries-old farmhouse, lending a hand at an autopsy in a local mortuary, the essential requisites of his London bag—ophthalmoscope, litmus, finger-stalls, needles—proving equally useful in his new life.

During the last war Carlill held a commission in the Navy and was on the battle-cruiser *New Zealand* in the Dogger Bank incident. Experience as neurologist at Haslar, where he was associated with Paul Fildes, provided much material for a Hunterian lecture on syphilis of the central nervous system in which he drew the general conclusion that the possibility of a syphilitic basis should be considered in every case of nervous disease, for the outlook of early treatment is very bright; it is not too much to hope, he wrote, that future generations of students will learn of tabes dorsalis and dementia paralytica only from their textbooks. He was equally emphatic that hysterical disabilities are amenable to early treatment or rather to prevention before onset by reassurance. In the treatment of consolidated cases he was assiduous (thoroughly hard work, he described it), refusing to be put off the scent by failure. On one occasion he was reproached for "professional lying" after he had performed a trephining operation for a case of hysterical sleeping attacks, but justified his action in a spirited reply. "My critics did not say," he rejoined, "what I should have done to the patient."

Hildred Bertram Carlill was educated at Harrow, St. John's College, Cambridge, and Guy's Hospital from which he qualified in 1907. During prolonged postgraduate study he visited the Mayos at Rochester and Kitasato in Japan. He was at various times physician to the Miller and Dreadnought Hospitals, Greenwich, the West End Hospital for Nervous Diseases, and the Ministry of Pensions. In 1922 he married Mildred Constance Godfrey, who survives him with a son and two daughters.

ADRIEN LOIR

M.B.E., LL.D. GLASG.

Dr. Adrien Loir, who is reported to have died in Paris on Dec. 16 in his eightieth year, was for six fruitful years assistant to his uncle, Louis Pasteur. A stroke had left his uncle paralysed on his left side and Adrien's father, a professor of chemistry at Lyon, trained his son in laboratory technique so that he might carry out experiments at his uncle's direction. In 1882 Adrien joined Pasteur in the laboratory in the rue d'Ulm where they worked together every day while the famous investigations on rabies and anthrax were being carried out. In March, 1886, twenty-one Russians from Smolensk were successfully inoculated for hydrophobia, and later that year Loir was chosen to go to St. Petersburg where the first foreign Pasteur Institute was being established. In 1888 the Pasteur Institute in Paris was founded and in the next year Loir visited Australia on behalf of his uncle. Four years later he was posted to the institute at Tunis which he directed for nine years. The Association française pour l'avancement des sciences sent him to Canada in 1906 and while studying trichiniasis there he held a chair at the University of Montreal. He returned to France in 1909 to take up the post of medical officer of health at Le Havre, and here he found scope for his interests within and without medicine. His contribution to the principles of public health was considerable and his interest in their application was unremitting, while for many years he was curator of the local natural history museum and director of the oceanographical laboratory of the University of Caen. Many British officers stationed at the base camp at Le Havre during the last war will remember his ready helpfulness which was later officially recognised by the award of the MBE. His own profession at home and abroad were also eager to do him honour. He was hon. graduate of the University of Glasgow and an officer of the legion of honour, and when he retired in 1939 he was a member of the council of public health and president of the society of medical officers of health of France.

EDWIN MARION COX

M.D. COLUMBIA, L.S.A.

Dr. Marion Cox, who died on April 9, was educated at Johns Hopkins and graduated with honours from the University of Columbia, New York, in 1891. He was house-surgeon to the Roosevelt Hospital, N.Y., and assisted McBurney in his surgical work before coming to this country. In 1903 he qualified LSA and set up in practice in the West End of London. During the last war he was deputy commissioner to the American Red Cross in England and after the armistice he retired from medical work to devote himself wholeheartedly to book-collecting and bibliographical research which had long been his chosen hobby. His knowledge of rare books was wide and his memory for dates of issue and details of editions remarkable. He generously put this garnered wisdom and experience at the disposal of the London Library, serving on the committee from 1919 till his death. His contributions to bibliography and literary history included papers on François Villon, on Lyons as a literary centre in the 15th and 16th centuries, and on Louise Labé. His edition of Sappho's poems in his own translation appeared in 1924.

Births, Marriages and Deaths

BIRTHS

AGAR.—On April 15, at Oxford, the wife of Dr. W. T. Agar—a daughter.

EDWARDS.—On April 14, in London, the wife of Captain Richmond Edwards, R.A.M.C.—a son.

KING-TURNER.—On April 12, the wife of Dr. C. J. King-Turner, of Waterloo, Fairfield, Glos.—a son.

PIRIE.—On April 12, at Chelmsford, the wife of Dr. Harold Pirie—a son and daughter.

THOMSON.—On April 11, at Edgware, Middlesex, the wife of Major F. McConnell Thomson, R.A.M.C.—a daughter.

WILDE.—On April 11, at Belfast, the wife of Major J. F. Wilde, R.A.M.C.—a son.

MARRIAGES

MONRO—RHYS.—On April 16, at Cardiff, Andrew Killey Monro, F.R.C.S., to Diana Louise Rhys.

TWORT—SMITH.—On April 18, at Sevenoaks, Reginald Joseph Twort, M.R.C.P., flight-lieutenant R.A.F.V.R., to Francis A. Smith, P.M.R.A.F.N.S.R.

DEATHS

CARLILL.—On April 16, at Tavistock, Hildred Bertram Carlill, M.D. CAMB., F.R.C.P., aged 60.

COOPER.—On April 15, at Enniskillen House, Princes Risborough, Francis William Cooper, L.R.C.P.E., aged 61.

FITZGERALD.—On April 13, Richard Desmond Fitzgerald, M.C., M.D. DUBL., D.T.M. & H., late D.M.S., Straits Settlements.

TURNER.—On April 14, at Grimsby, Charles Byron Turner, M.R.C.S.

WAREHAM.—On April 18, Sidney James Wareham, F.R.C.S., of Ide Hill, Kent, aged 71.

WILKIN.—On April 16, at Rose Ash, North Devon, Lancelot Wilkin, M.A. CAMB., F.R.C.S., aged 71.

Appointments

Colonial Medical Service.—The following appointments have been made:—

CHARRON, K. C., M.D.: M.O., Tanganyika;
COOKSON, O. L. C., M.B. LOND.: M.O., Northern Rhodesia;
FARR, A. G., M.B. CAMB.: M.O., Tanganyika; and
SANDFORD, A. R., M.R.C.S.: M.O., Kenya.

Notes, Comments and Abstracts

GIFTS FOR THE RCS MUSEUM

In addition to the many offers of help towards the restoration of the museum of the Royal College of Surgeons which have already been announced, some notable gifts and promises have recently been received. The council of the University of Manchester, on the suggestion of Prof. Wood Jones, has presented the specimens assembled and prepared by the late Prof. Morrison Watson to illustrate Hunterian ideals. The medical committees of the Royal Cancer Hospital and of St. Mark's Hospital have presented specimens illustrating different forms of malignant disease. The Royal Australasian College of Surgeons is arranging for hospitals throughout Australia and New Zealand to collect specimens illustrating pathological conditions common in those countries and seldom met with in the British Isles. The specimens will be stored in the different hospitals and presented to the English college after the war. The authorities of the Institute of Anatomy at Canberra have earmarked a considerable number of duplicate specimens for transfer to England and have promised that after the war they will organise expeditions to collect specimens of those rare marsupials and monotremes of which they do not possess duplicates. The High Commissioner for New Zealand has interested his Prime Minister in the restoration of the museum and the Minister of Health for the Dominion is enlisting the help of New Zealand surgeons in the collection of specimens. Sir Ali Ibrahim Pasha, rector of the Egyptian University, Prof. S. Azmi Pasha, dean of the faculty of medicine, have also sent assurances that Egyptian surgeons will arrange for the collection of specimens illustrating diseases not met with in Great Britain.

TEACHING ABOUT VERMIN

School teachers are familiar with the forms of vermin that trouble their pupils and are well able to inculcate sound hygienic ideas into the minds of the next generation. At the instance of the Liverpool education committee, Dr. Raymond Gamlin has drawn up a pamphlet, which deals with lice, bugs and scabies, to be circulated to all elementary school teachers in the city. This entirely fulfils its purpose. Avoiding technicalities, it gives full information including the results of recent research. From cover to cover emphasis is laid on the cleanliness which is the first line of defence against vermin, with the exception perhaps of the itch mite, which can hardly be dislodged by washing or scrubbing. The illustrations are clear enough to identify the various parasites. Other education committees might well follow suit.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED APRIL 11

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 939; whooping-cough, 1269; diphtheria, 736; paratyphoid, 6; typhoid, 3; measles (excluding rubella), 3757; pneumonia (primary or influenzal), 1089; puerperal pyrexia, 187; cerebrospinal fever, 199; poliomyelitis, 2; encephalitis lethargica, 5; dysentery, 168; ophthalmia neonatorum, 73. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on April 8 was 1514, including scarlet fever, 119; diphtheria, 195; measles, 152; whooping-cough, 504; enteritis, 58; chicken-pox, 68; erysipelas, 33; mumps, 78; poliomyelitis, 1; dysentery, 33; cerebrospinal fever, 31; puerperal sepsis, 21; enteric fevers, 8; german measles, 8; glandular fever, 3; other diseases (non-infectious), 105; not yet diagnosed, 97.

Deaths.—In 126 great towns there were no deaths from enteric fevers, 1 (0) from scarlet fever, 3 (0) from measles, 14 (2) from whooping-cough, 25 (0) from diphtheria, 37 (6) from diarrhœa and enteritis under 2 years, and 33 (2) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 4 deaths from diphtheria. There were 6 fatal cases of diarrhœa at Birmingham.

The number of stillbirths notified during the week was 253 (corresponding to a rate of 42 per thousand total births), including 24 in London.

Medical News

Medical Honours

The following awards have been made to medical men for distinguished services in Middle East between July and October of last year:

O.B.E.—Temp.-Colonel R. P. Cormack, M.B. Edin., R.A.M.C., and Lieut.-Colonel Ram Nath Khosla, M.B. Punjab, I.M.S.

M.B.E.—Captain (temp. Major) M. M. Medine, L.M.S. P.E.I., R.A.M.C., and Captain A. D. Picton, B.M. Oxfd, R.A.M.C.

M.C.—Captain (acting Major) R. J. Niven, M.B. Lond., R.A.M.C.

The King has given authority to Major John Gilmour, F.R.C.S.E., R.A.M.C., to wear the insignia of grand officer of the Order of Ismail which the King of Egypt has conferred on him in recognition of his services as president of the Egyptian sanitary quarantine board.

Medical Casualties

Major W. J. E. Phillips, M.B. Camb., R.A.M.C., and Captain L. D. Stone, M.R.C.S., R.A.M.C., have been posted as missing since the fall of Singapore. Lieut.-Colonel John Huston, M.B. Belf., R.A.M.C., is reported missing in Malaya. Dr. Elizabeth Le Sueur and Dr. E. M. Marjoribanks are missing, believed to be prisoners in Sarawak.

Medical Society of London

Surgeon Rear-Admiral G. Gordon-Taylor will deliver his presidential address at 5 P.M. on Friday, April 27, at 11, Chandos Street, W.1. He will speak on amputations.

Royal Society of Medicine

Mr. D. Greer Walker will read a paper to the section of odontology on Monday, April 27, at 4.30 P.M. He will discuss whether teeth and comminuted bone should be removed in fractured jaws. At the section of otology on May 1 at 10.30 A.M., Mr. D. W. C. Northfield and Mr. Terence Cawthorne will open a discussion on brain atlas. The section of laryngology and otology will hold a clinic-pathological meeting at 2.30 P.M. on the same day. The section of anæsthetics is also meeting at 2.30 P.M. on that day when Flight-Lieutenant E. A. Pask will read a paper on convulsions.

Ophthalmological Society of the United Kingdom

The annual congress will be held on May 29 and 30 at 1, Wimpole Street, London, W.1. At the Friday morning session Major G. I. Scott and Mr. Arnold Sorsby will open a discussion on the value of sulphonamides in ophthalmology. On the Saturday morning Dr. Raymond Greene and Mr. F. A. Williamson Noble will introduce on the rôle of vitamins in ophthalmology. Further information from the acting hon. secretary, Mr. Frank Law, 36, Devonshire Place, W.1.

Our Daily Break

Two Bradford firms have agreed to lend some of their employees for an hour every day to the Board of Education to test the effect of a break with physical training on health and work. A physical-training teacher lent by the Bradford education committee will hold classes daily at schools near the works, which the selected employees, girls of 16–18, will attend. After six months their records for health and output will be compared with those of control groups of their colleagues who have not taken part in the classes. The programme will include exercises, training with apparatus, swimming and games such as basket ball, and the girls will also be medically examined. The Medical Research Council is coöperating with the board in arranging the investigation and a similar scheme has already been begun at Gateshead.

London will Spend . . .

During 1942–43 the London County Council plans to spend £6,123,385 on its hospitals and medical services. This decrease of over £1,093,000 compared with last year is mainly due to the reduction of bed accommodation owing to enemy action and the restrictions imposed by rationing. The estimate for expenditure on mental hospitals is £4,347,665, an increase of over £224,000. The social welfare committee expect to spend £1,830,640, a reduction of over £249,000 due to the fall in the number of people on relief. Owing to difficulties arising out of the food-rationing regulations relief in kind will be discontinued for the present and district welfare officers will issue cash relief for the purchase of extra nourishment.

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The Examination is open to any student of medicine, whether holding a medical qualification or not, who, subsequently to the date of passing his professional examination in anatomy and physiology for a medical qualification, commenced clinical studies not less than two and a half and not more than five years previously at a medical school in London, recognised by the Royal College of Physicians, or at the University of Edinburgh, including medical classes recognised by the Medical Faculty of the University.

The Scholarship is of the value of Twenty Guineas and is tenable for one year.

Intending candidates are required to send their names to the Registrar of the Royal College of Physicians, Pall Mall East, London, not later than 20th May, with evidence of the duration of their medical studies from the deans of their respective schools, and evidence of the date at which they passed their examination in anatomy and physiology.

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Pall Mall East, S.W.

The London Homœopathic Hospital,

Great Ormond-street and Queen-square, Bloomsbury, W.C.1.

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28, Portland-place, London, W.1.

L. M. S. S. A.

FINAL EXAMINATION: SURGERY, May 11th, June 8th, July 13th, 1942; MEDICINE, May 18th, June 15th, July 20th, 1942; MIDWIFERY, May 19th, June 16th, July 21st, 1942.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

THE MAGHULL HOMES FOR EPILEPTICS (Inc.)

MAGHULL (near LIVERPOOL)

FARMING and OPEN AIR OCCUPATION for PATIENTS

A few vacancies in 1st and 2nd Class Houses.

FEES: 1st Class (men only) from £3 per week upwards.
2nd Class (men and women) 37/6 per week.

For further particulars apply: **C. EDGAR GRISEWOOD, A.C.A.**
Secretary, **20, Exchange Street East, Liverpool, 2**

Telephone: WELbeck 2728 Telegrams: "ASSISTIAMO, LONDON"

For MEDICAL, SURGICAL, and

MENTAL NURSES

Male or Female

THE NURSES' ASSOCIATION

In conjunction with the MALE NURSES' ASSN.

29, YORK ST., BAKER ST., LONDON, W.1

Mrs. MILLICENT HICKS, *Superintendent* W. J. HICKS, *Secretary*

PECKHAM HOUSE, 112, Peckham Road, London, S.E.15

Telegrams: "Alleviated, London" **Telephone: Rodney 2641-2642**

A Private Mental Hospital, for Ladies and Gentlemen suffering from Nervous and Mental Illness, where the amenities of a comfortable home are combined with full investigation and every well-established modern treatment.

Terms from 3¼ guineas weekly.

Illustrated Prospectus may be obtained from the Physician Superintendent.

CAMBERWELL HOUSE, 33, Peckham Road, London, S.E.5

Telegrams: "PSYCHOLIA, LONDON" — *Telephone:* RODNEY 4343 (3 lines)

FOR THE TREATMENT OF MENTAL DISORDERS

Completely detached Villas for mild cases. Voluntary Patients received. Twenty acres of grounds; own garden produce. Hard and grass tennis courts, putting greens, Recreation Hall with Badminton Court, and all indoor amusements. Occupational therapy, Calisthenics, Actino-therapy, prolonged immersion baths, shock and also modified insulin treatment. Chapel.

Senior Physician, Dr. HUBERT JAMES NORMAN, assisted by a resident Medical Staff and visiting Consultants

An Illustrated Prospectus giving fees, which are strictly moderate, may be obtained upon application to the Secretary

The Convalescent Branch is HOVE VILLA, BRIGHTON, and is 200 ft. above sea-level

COURT HALL, KENTON, near EXETER

FOR THE TREATMENT OF EIGHT LADIES, VOLUNTARY, TEMPORARY AND CERTIFIED PATIENTS

CLIFFDEN, TEIGNMOUTH

FOR EARLY AND CONVALESCENT CASES Recreational Therapies are held daily by skilled Leaders

The house stands high with spacious balconies and extensive views of the South Devon Coast. Beautiful garden. Own Dairy in 25 acres. Private road to beach

There is also a charming house, **EBWORTHY, MANATON, DARTMOOR**, situated in 20 acres, 1100 ft. up for bracing moorland air

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P. *Telephones*—STARCROSS 259 and TEIGNMOUTH 289

HAYDOCK LODGE,

NEWTON-LE-WILLOWS, LANCASHIRE.

For the reception and treatment of PRIVATE PATIENTS of both sexes of the UPPER AND MIDDLE CLASSES suffering from Mental and Nervous Disorders, Alcoholism and Drug Addiction, either voluntarily, temporarily, or under certificate. Patients are classified in separate buildings according to their mental condition. Situated in park and grounds of 400 acres. Self-supported by its own farm and gardens in which patients are encouraged to occupy themselves. Every facility for indoor and outdoor recreation. For terms, prospectus, etc., apply MEDICAL SUPERINTENDENT. *Telephone:* Ashton-in-Makerfield 7311. *Telegraphic Address:* Wootton, Ashton-in-Makerfield.

THE LAW NURSING HOME

ROCHDALE (Lancs)

A Private Hospital, exclusively for the treatment of POST-ENCEPHALITIC PARKINSONISM, PARKINSON'S DISEASE and ALLIED DISORDERS

Founder: The late SIR A. J. LAW, J.P., M.P.

The Nursing Home is governed by Trustees; any surplus is utilized to help patients who cannot afford full fees. Extensive grounds. Hydro. Expert Massage and Physical re-education. Dietary treatment. Equipped with every laboratory apparatus for the investigation and treatment of the diseases. Results of the BULGARIAN TREATMENT published (*Lancet*, 1939, I, 693) approx.: 300 patients treated in the last 3 years. Terms moderate. Further particulars apply Medical Superintendent. Tel.: Rochdale 2960.

THE OLD MANOR, SALISBURY

Telephone: 3216 & 3217

A Private Hospital for the Care and Treatment of those of both sexes suffering from MENTAL DISORDERS

Extensive grounds. Detached Villas. Chapel. Garden Produce from own gardens. Terms very moderate.

CONVALESCENT HOME AT BOURNEMOUTH

standing in 12 acres of ornamental grounds, with separate villas, tennis courts, etc. Patients or Boarders may visit the Home by arrangement.

Illustrated Brochure on application to the Medical Superintendent, The Old Manor, Salisbury.

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A Private Clinic, the first in Great Britain, for investigation and treatment of all forms of disease, except infectious and mental

There is a steel and concrete Air Raid Shelter with heating and a lift to all floors

Inclusive charges **Apply SECRETARY** **Telephone: Ruthin 66**

THE CASSEL HOSPITAL FOR FUNCTIONAL NERVOUS DISORDERS

new address: ASH HALL, BUCKNALL, near STOKE-on-TRENT, STAFFS *Telephone:* ASH BANK 216

Temporarily removed from Swaylands, Penshurst, Kent, to above country house about five miles from Stoke in the direction of Ashbourne.

The Hospital will continue to admit for treatment patients of moderate means suffering from psychoneurotic illnesses.

Patients suffering from psychotic illnesses are not eligible for admission.

Further particulars may be obtained by application to the Medical Director at the new address.

VALE OF CLWYD SANATORIUM

This Sanatorium is established for the treatment of Tuberculosis of the Lungs and the Pleural Cavities. It is situated in the midst of a large area of park-land at a height of 450 feet above sea-level. Average rainfall 29·57 per annum. Full day and night Nursing Staffs. X-ray plant. Every facility for Artificial Pneumothorax and for operations on the Chest. Electric Lighting. Central Heating.

For particulars apply to Medical Superintendent.

H. MORRISTON DAVIES, M.D., M.Ch. (Cantab.), F.R.C.S., Llanbedr Hall Ruthin, N. Wales.

THE COTSWOLD SANATORIUM

On the Cotswold Hills seven miles from Cheltenham, Stroud and Gloucester. Fully equipped for the treatment of all forms of Tuberculosis. **Terms: 5½ to 9½ guineas per week, inclusive.** Full particulars from MEDICAL SUPERINTENDENT, Cotswold Sanatorium, Cranham, Gloucester. *Telephone:* Witcombe 81. *Telegrams:* "Hoffman, Birdlip."

SHAFTESBURY HOUSE

FORMBY-BY-THE-SEA Nr. LIVERPOOL

Specially built and licensed for the care and treatment of a limited number of Ladies and Gentlemen suffering from NERVOUS and MENTAL breakdown. Voluntary and certified patients received. Ladies also admitted as Temporary Patients without certification. Terms moderate. *Apply,* RESIDENT PHYSICIAN, who may be seen in Liverpool, by appointment. *Tel. No.* 8 *Formby.*

CHEADLE ROYAL

CHEADLE CHESHIRE

A Registered Hospital for MENTAL DISEASES, and its Seaside Branch, GLAN-Y-DON, Colwyn Bay, N. Wales

THE object of this Hospital is to provide the most efficient means for the treatment and care of those of the Upper and Middle Classes suffering from MENTAL and NERVOUS DISEASES. The Hospital is governed by a Committee appointed by the Trustees of the Manchester Royal Infirmary VOLUNTARY, TEMPORARY, AND CERTIFIED PATIENTS RECEIVED

For Terms and further information apply to the MEDICAL SUPERINTENDENT *Telephone:* GATLEY 2231

ROYAL EARLSWOOD INSTITUTION

REDHILL, SURREY

For MENTAL DEFECTIVES of all ages

Training under medical supervision. Schools, Farm, Trade Workshops, Recreations. Fees £110 to £375 p.a. Election by votes of subscribers at reduced terms for necessitous trainable cases.

Apply, Secretary. Tel.: Redhill 344.

FENSTANTON

at "FIVE DIAMONDS," Chalfont St. Giles, Bucks

A Private Home for the Care and Treatment of a limited number of LADIES with Mental and Nervous Disorders. Certified, Voluntary, and Temporary Patients received. Mansion with 12 acres of ground. (See *Medical Directory*, p. 2302.) Apply Resident Physician. Telephone: Little Chalfont 2046. Station: Chalfont and Latimer.

THE COPPICE, NOTTINGHAM

HOSPITAL FOR MENTAL DISEASES

President: The Right Hon. LORD BELPER

REGISTERED HOSPITAL for Voluntary, Temporary, or Certified PRIVATE PATIENTS of UPPER and MIDDLE CLASSES. Own kitchen garden. Modern forms of treatment, including Electro-shock Therapy. Out-door games, cinema visits, motor drives arranged. Visiting Chaplain.

For terms, &c., apply to: Dr. G. M. WODDIS, Medical Superintendent. Telephone: 84117 Nottingham.

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Phone: BEDFORD 3417. **Near BEDFORD**

For Mental Cases with or without Certificates.

Ordinary Terms: Five Guineas per week (including Separate Bedrooms for all suitable cases without extra charge).

For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.

INTERVIEWS IN LONDON BY APPOINTMENT.

CITY OF LONDON MENTAL HOSPITAL

Near DARTFORD, KENT.

Ladies and Gentlemen received for treatment under certificates, and without certificates as either VOLUNTARY or TEMPORARY PATIENTS, at a weekly fee of £2 9s., and upwards.

CHISWICK HOUSE,

PINNER, MIDDLESEX.

Telephone: PINNER 234.

A Private Hospital for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern country house, 12 miles from Marble Arch, in attractive and secluded surroundings. Fees from 10 guineas per week inclusive. Cases under Certificate, Voluntary and Temporary Patients received for treatment.

DOUGLAS MACAULAY, M.D., D.P.M.

THE GROVE HOUSE,
CHURCH STRETTON, SHROPSHIRE.
Private Home for Ladies mentally ill. Voluntary and Temporary Patients received.
Medical Superintendent: Dr. J. A. MCCLINTOCK.

UNIVERSITY EXAMINATION POSTAL INSTITUTION

17, RED LION SQUARE, LONDON, W.C.1

Over 50 years' experience

POSTAL COACHING FOR ALL MEDICAL EXAMINATIONS

MEDICAL PROSPECTUS (36 pages)
sent gratis, along with List of Tutors, &c., on application to the Principal, 17, Red Lion-square, London, W.C.1. (Telephone: HOLborn 6313.)

The Salvation Army,

THE MOTHERS' HOSPITAL, Lower Clapton-road, Clapton, E.5.

Applications are invited from medical Women for the post of SENIOR RESIDENT MEDICAL OFFICER (B2), vacant 1st June, 1942. Salary £150 per annum, with board, residence, and laundry. The appointment is for six months or twelve months. Applications are also invited for the post of JUNIOR RESIDENT MEDICAL OFFICER (A), vacant 1st June, 1942. Salary £80 per annum, with board, residence, and laundry. The appointment is for six months.

Applications, with testimonials, to be sent to the Superintendent not later than 29th April, 1942.

FRED HAMMOND, Superintendent.

Middlesex County Council.

RESIDENT CASUALTY OFFICER (B1) required for REDHILL COUNTY HOSPITAL, Edgware, Middlesex. Must be registered medical practitioners (including suitably qualified R practitioners in B2 or B1 posts) who have held house appointments in general hospitals and had good all-round experience. Salary £350 per annum, plus cost-of-living bonus. Board, lodging, and laundry. Whole-time duties under Medical Superintendent will include dealing with casualties and admissions to hospital, and such other duties as may be required. Appointment, subject to medical examination and one month's notice, is primarily for six months with possibility of extension for further six months. Post vacant 15th May, 1942.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, to the undersigned. No application forms provided. Relationship to any member or officer of the Council to be disclosed. Copies of not more than three recent testimonials. Canvassing, directly or indirectly, will disqualify. Closing date 9th May, 1942. C. W. RADCLIFFE, "B3," Clerk of the County Council. Guildhall, Westminster, S.W.1.

Memorial Hospital,

Shooters Hill, London, S.E.18.
(General Hospital—112 Beds.)

Applications are invited from Male registered medical practitioners (including R practitioners within six months of qualification) for the appointment of a JUNIOR RESIDENT MEDICAL OFFICER (A post), to become vacant on 1st June, 1942. The appointment will be for six months. Remuneration will be at the rate of £175 per annum, with full residential emoluments.

Applications should be made on the prescribed form, obtainable from the undersigned, and sent in with copies of three recent testimonials to reach him not later than 14th May, 1942.

R. S. G. HUTCHINGS, Secretary.

University of London.

The Senate invite applications for the UNIVERSITY READERSHIP IN ORGANIC CHEMISTRY tenable at LONDON (R.F.H.) SCHOOL OF MEDICINE FOR WOMEN. Salary £500–£700 a year.

Applications must be received not later than first post on Tuesday, 12th May, 1942, by the ACADEMIC REGISTRAR, University of London, Richmond College, Richmond, Surrey, from whom further particulars should be obtained.

British Postgraduate Medical School.

(UNIVERSITY OF LONDON.)

Applications are invited for the post of RESIDENT ASSISTANT PHYSICIAN (B1). Applicants should have held house appointments. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Preference will be given to candidates holding an M.D. degree or the diploma of M.R.C.P., or who have special experience in Tuberculosis. The appointment will be in the first place for six months, and the salary is at the rate of £250 per annum, with the usual residential emoluments. An additional allowance will be made if appointed to take charge of the Tuberculosis Clinic at the Hospital.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by three recent testimonials, should be addressed to the DEAN, British Postgraduate Medical School, Ducane-road, W.12, not later than Tuesday, 28th April, 1942.

British Postgraduate Medical School.

(UNIVERSITY OF LONDON.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON—Obstetrics (A) on the 1st June, 1942, including R practitioners within three months of qualification. The appointment is for six months and carries a salary of £105 per annum, plus the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, should be sent to the DEAN, British Postgraduate Medical School, Ducane-road, Shepherd's Bush, W.12, not later than Tuesday, 5th May, 1942.

British Postgraduate Medical School.

(UNIVERSITY OF LONDON.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of Two HOUSE PHYSICIANS (A) on the 1st June, 1942, including R practitioners within three months of qualification. The appointment is for six months and carries a salary of £105 per annum, plus the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, should be sent to the DEAN, British Postgraduate Medical School, Ducane-road, W.12, not later than Tuesday, 5th May, 1942.

Royal Free Hospital,

Gray's Inn-road, London, W.C.1.

Applications are invited from registered medical practitioners for the appointment of RESIDENT ASSISTANT MEDICAL REGISTRAR (B1). The duties will comprise mainly those of Casualty Officer. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary £350 per annum, payable by the Ministry of Health.

Applications, stating age, and accompanied by copies of three recent testimonials, should be sent to the undersigned (from whom all information may be obtained) on or before the 9th day of May. Duties to commence 1st June.

RICHARD T. BARTLEY, Secretary.

British Broadcasting Corporation.

Applications are invited for the post of MEDICAL OFFICER. Applicants must be of British nationality and have British medical qualifications, preferably including the diploma in Public Health. They should have had public health or similar experience enabling them to advise the Corporation on all matters concerning the health, physical welfare, and conditions of service of staff throughout the country. The appointment is for the duration of the war, and there can be no guarantee of entry to the permanent staff. The salary is on a scale rising from a minimum of £1050 a year by annual increments of £75 to a maximum not exceeding £1500 a year.

Applications, marked "Medical Officer," must be made on a form which will be sent by the RECRUITMENT DIRECTOR, Broadcasting House, London, W.1, on receipt of a stamped addressed foolscap envelope. Completed forms must be received by the 15th May.

Metropolitan Hospital, London, E.8.

Applications are invited from registered medical practitioners (Male) for the appointment of RESIDENT HOUSE SURGEON (A), to become vacant on 1st May, including R practitioners within three months of qualification. The appointment is for a period of six months. Salary at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent at once to—

FRANK JENNINGS, House Governor and Secretary.

Hospital for Consumption and Diseases

OF THE CHEST, Brompton, S.W.3.

The Committee of Management invite applications for the post of TEMPORARY PATHOLOGIST (B1), preferably for whole-time duty. Salary according to experience, but not exceeding £550 per annum, and, subject to the requirements of the Hospital being fully met, private practice will not be debarred. The appointment is for twelve months in the first instance. Duly qualified Women are eligible for appointment, and suitably qualified R practitioners holding B2 or B1 posts may apply.

Applications, with copies of testimonials, must reach the undersigned not later than Wednesday, 13th May, 1942.

Brompton Hospital, S.W.3. F. G. ROUVRAY, Secretary.

Battersea General Hospital,

London, S.W.11.

APPOINTMENT OF HOUSE PHYSICIAN (A).

Applications are invited from registered medical practitioners, Male or Female, for the above appointment, including R practitioners within three months of qualification. The appointment is for six months. The salary is at the rate of £140 per annum, with full residential emoluments.

Applications, stating age, nationality, and qualifications, and accompanied by copies of two recent testimonials, should be sent to the SECRETARY of the Hospital immediately.

Royal Eye Hospital,

St. George's-circus, S.E.1.

Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON (B2), to become vacant immediately. R practitioners holding A posts may apply when appointment will be limited to six months; otherwise may be extended for a further six months. Salary is at the rate of £150 per annum, with full emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by three recent testimonials, should be sent to: F. E. D'ALTON, Secretary.

County Borough of West Ham.

Applications are invited for the post of TEMPORARY FIRST ASSISTANT MEDICAL OFFICER at FOREST GATE HOSPITAL, Forest-lane, E.7, for the duration of the war, but can be terminated at any time by one month's notice by either side. Salary £525 per annum, rising by annual increments of £25 to a maximum of £600 per annum, plus temporary war bonus, with apartments, board, and laundry valued at £150.

Candidates must be qualified registered medical practitioners, and preference will be given to those who have had, in addition to a general hospital appointment, an appointment in a hospital where they have had charge of maternity beds. The person appointed will be in charge of the hospital during the absence of the Medical Superintendent.

The successful candidate must be prepared to serve in any other of the Council's institutions.

The appointment will be subject to the Council's regulations as made from time to time regarding holidays, sick pay, &c., and the successful candidate will be required to pass a medical examination.

Forms, upon which application must be made, with relevant particulars, can be obtained from Dr. E. Ashworth Underwood, Medical Officer of Health, 88, Romford-road, West Ham, E.15, on receipt of a stamped addressed foolscap envelope, and should be returned to the undersigned not later than 6th May, 1942.

Canvassing members of the Council is prohibited and will disqualify. CHARLES E. CRANFIELD, Town Clerk.

Town Hall, West Ham, E.15, 15th April, 1942.

Nottinghamshire County Council.

RANSOM SANATORIUM.

Applications are invited from duly qualified and registered Female medical practitioners for the appointment of JUNIOR ASSISTANT RESIDENT MEDICAL OFFICER (B2) at the COUNTY TUBERCULOSIS SANATORIUM, Sherwood Forest, near Mansfield (165 Beds).

The salary, payable monthly, will be at the rate of £200 per annum, plus war bonus, together with board, residence, and laundry. The appointment is a temporary one and will be terminable by one month's notice on either side.

The person appointed will be required to reside at the Sanatorium and will act under the direction of the Medical Superintendent and perform such duties as may be prescribed.

Applications, stating age, qualifications, and experience, and accompanied by copies of not more than three recent testimonials, should be forwarded to the County Medical Officer, Shire Hall, Nottingham, as soon as possible.

K. TWEEDALE MEABY, Clerk of the County Council.

Shire Hall, Nottingham, 16th April, 1942.

Doncaster Royal Infirmary.

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for a HOUSE SURGEON (Male) (A appointment) required immediately. The appointment is for six months. Salary at the rate of £175 per annum, with residence, board, and laundry. This large industrial area offers excellent opportunities for gaining experience.

Applications, accompanied by not more than three testimonials, to be sent immediately to—

R. LANCASTER, Secretary-Superintendent.

Borough of Romford.

Applications are invited from duly qualified and registered medical practitioners for the post of Whole-time ASSISTANT MEDICAL OFFICER (Woman) experienced in antenatal work, midwifery, and children's diseases. Preference will be given to applicants who hold a Diploma in Public Health or State Hygiene. The selected candidate will be required to hold consultations at the Antenatal and Maternity and Child Welfare Centres of the Council, and to perform such other duties as may be required of her. She will be a member of the staff of the Medical Officer of Health, and will work under his control and direction.

The salary will be £500 per annum, rising by annual increments of £25 to a maximum of £700 per annum.

The person appointed will be required to devote the whole of her time to the duties of her office and will not be allowed to engage in private practice.

The post is subject to superannuation deductions, and the selected candidate will be required to pass satisfactorily a medical examination.

Applications, stating age, whether married or single, qualifications, and previous experience, accompanied by copies of not more than three recent testimonials, should be endorsed "Assistant Medical Officer" and delivered to me not later than 4th May. There are no forms of application.

Canvassing in any form will disqualify.

J. TWINN, Town Clerk.

Town Hall, Romford, 15th April, 1942.

Derbyshire County Council.

The Derbyshire County Council require the services of a fully qualified Whole-time WOMAN ASSISTANT MATERNITY AND CHILD WELFARE MEDICAL OFFICER with experience in antenatal work, midwifery, and children's diseases, to hold (under the direction of the County Medical Officer of Health) consultations at the Antenatal and Maternity and Child Welfare Centres of the Derbyshire County Council, and to perform such other duties as appertain to the office.

The salary will be £600 per annum, rising by £25 per annum to £700 per annum.

The post will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Forms of application may be obtained from the undersigned, to whom they must be returned, together with copies of not more than three recent testimonials, not later than 9th May, 1942. W. M. ASH, County Medical Officer of Health.

New County Offices, St. Mary's-gate, Derby, 16th April, 1942.

Northumberland County Council.

HEXHAM HOSPITAL. (440 Beds.)

Applications are invited from registered medical practitioners (Male) for the appointment of RESIDENT SURGICAL OFFICER (B1). Applicants should have held previous house appointments. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. The appointment in the first instance will be for one year, and the salary will be at the rate of £550 per annum, together with full residential emoluments. The Hospital contains an Orthopædic Centre.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent immediately to the County Medical Officer at the undermentioned address.

C. HAROLD CARTER, Clerk of the County Council.

New Senior School, Mitford-road, Morpeth, Northumberland.

Queen Victoria Hospital,

MORECAMBE AND HEYSHAM.

Applications are invited for the post of RESIDENT HOUSE SURGEON (Female), vacant 1st July, 1942. Salary £150 per annum. The Hospital has 72 Beds, with Maternity, Massage and Electrical Treatment, X-ray, Pathological, and Out-patient Departments.

Applications, stating age, nationality, qualifications with dates, and experience, accompanied by copies of testimonials and photographs, should be sent, endorsed "House Surgeon," not later than 9th May, 1942, to: THOS. P. TIPLADY, Secretary.

Norfolk County Council.

TEMPORARY CLINICAL TUBERCULOSIS OFFICER required for WEST NORFOLK. Salary £750–£25–£937 10s., with travelling expenses.

Further particulars from County Medical Officer, 29, Thorpe-road, Norwich. H. C. DAVIES, Clerk of the Council.

County Offices, Thorpe-road, Norwich, 15th April, 1942.

Gloucestershire County Council.

Gloucestershire County Council invite applications for the appointment of a TEMPORARY ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH at a salary of £500 per annum. Applicants must be registered medical practitioners. The appointment will be subject to a satisfactory medical report by the Council's Medical Adviser.

Forms of application, with particulars of the duties and conditions of appointment, may be obtained from the County Medical Officer of Health, 18, Berkeley-street, Gloucester, to whom completed applications, with copies of three recent testimonials, should be sent not later than 15th May. Canvassing, directly or indirectly, will disqualify.

RICHARD L. MOON, Clerk of the County Council.

City and County of Newcastle UPON TYNE.

SHOTLEY BRIDGE HOSPITAL.

Applications are invited from registered medical practitioners for the appointment of RESIDENT SURGICAL OFFICER (B1). Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £550 per annum, together with the usual residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent immediately to the MEDICAL OFFICER OF HEALTH, Health Department, Town Hall, Newcastle upon Tyne, 1.

Preston and County of Lancaster

ROYAL INFIRMARY.

Applications are invited from registered medical practitioners for the post of CASUALTY HOUSE SURGEON (B2), including R practitioners holding A posts when appointment will be limited to six months. The duties are mainly in the Casualty Department and Plaster Room, with care of the beds of the Assistant Surgeons. Salary at the rate of £175 per annum, with the usual residential allowances.

Applications, stating age, qualifications with dates, and nationality, and present post (if any), accompanied by copies of recent testimonials, should be forwarded as soon as possible to: JOHN GIBSON, Superintendent and Secretary.

Royal Infirmary, Preston.

Lancashire County Council.

BIDDULPH GRANGE ORTHOPÆDIC HOSPITAL.

Applications are invited from registered medical practitioners Male or Female, for the appointment of RESIDENT JUNIOR HOUSE SURGEON (B2), now vacant, including R practitioners who hold A posts when appointment will be limited to six months; otherwise it will be for a minimum period of six months. The salary is at the rate of £250 per annum, together with board, residence, and laundry.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of two recent testimonials, should be sent to Dr. F. Hall, School Medical and Child Welfare Department, County Offices, Preston, not later than the 9th May.

GEORGE ETHERTON, Clerk of the County Council.

County Offices, Preston, 17th April, 1942.

County Borough of Grimsby.

Applications are invited for the appointment of ASSISTANT MEDICAL OFFICER FOR CIVIL DEFENCE (Male) in the County Borough of Grimsby. The officer appointed will be responsible under the Medical Officer of Health for the general organisation and administration of the Casualties Services of the Borough, and may also occasionally be required to carry out such other duties as the Medical Officer of Health may so direct.

The appointment is a temporary one, subject to a month's notice on either side. The salary will be at the rate of £600 per annum, plus £30 per annum car allowance.

Applications, stating age, qualifications, and experience, together with copies of testimonials or names of persons to whom reference may be made, should be forwarded not later than the 30th April, 1942, to: L. W. HEELER, Town Clerk.

Municipal Offices, Grimsby, 16th April, 1942.

North Staffordshire Royal Infirmary,

STOKE-ON-TRENT.

Applications are invited from registered medical R practitioners (Male and Female) within three months of qualification for the following posts:—

CASUALTY OFFICER (A).
HOUSE PHYSICIAN (A).
RESIDENT ANÆSTHETIST (A).

The appointments will be for a period of six months. The salary in each case is at the rate of £150 per annum, with the usual residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent as soon as possible to the HOUSE GOVERNOR.

Kent and Sussex Hospital,

TUNBRIDGE WELLS.

APPOINTMENT OF RESIDENT HOUSE SURGEON AND CASUALTY OFFICER (B2).

(This post is recognised by the Council of the Royal College of Surgeons for purpose of the final Fellowship Examination.)

Applications are invited from registered medical practitioners, Male, for the above appointment, to become vacant 1st June, 1942, including R practitioners who now hold A posts when appointment will be limited to six months. The salary is at the rate of £200 per annum, with residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent as soon as possible to—

TOM B. HARRISON, Superintendent-Secretary.

18th April, 1942.

County of Warwick.

(AMENDED ADVERTISEMENT.)

Applications are invited for the position of Whole-time RADIOLOGIST to the WARWICKSHIRE COUNTY COUNCIL.

The duties of the office will be primarily concerned with the radiological diagnostic work at the six main hospitals under the control of the Council centred on the Warwick Hospital. The person appointed will be required regularly to visit each of the hospitals concerned, and he will not be permitted to undertake private practice.

Applicants must hold the D.M.R.E. or the F.F.R.

The inclusive salary of the office will be at the rate of £1000 per annum, rising by four annual increments of £50 to £1200 per annum, and the person appointed will be required to provide a car. Travelling allowances will be payable in accordance with the Council's B scale. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and is subject to three months' notice on either side to determine.

Applications, on forms which may be obtained from the Public Assistance Officer, Shire Hall, Warwick, should be returned to him not later than the 18th May, 1942.

L. EDGAR STEPHENS, Clerk of the Council.

Shire Hall, Warwick, 14th April, 1942.

County Borough of Warrington.

BOROUGH GENERAL HOSPITAL. (300 Beds.)

Applications are invited from registered medical practitioners, including R practitioners who now hold A posts, for the post of RESIDENT MEDICAL OFFICER (B2). Salary £225 per annum, together with board, residence, and laundry. There are two other Medical Officers in residence: good opportunity for experience in midwifery and surgery. Candidates must be single, fully qualified, and registered. Appointment for six months.

Applications, stating age, qualifications, and experience, and date available to commence duties, together with copies of not less than three testimonials, to be sent not later than Wednesday, 29th April, 1942, to—

STUART F. ALLISON, Medical Officer of Health and Medical Superintendent of Corporation Hospitals.

Health Department, Warrington, April, 1942.

Royal United Hospital, Bath.

Applications are invited from registered medical practitioners (Male) for the following appointment, which becomes vacant immediately: HOUSE SURGEON (A) (General Surgery and Ear, Nose, and Throat). R practitioners within three months of qualification may apply when appointment will be for a period of six months. Salary £150 per annum, with board, residence, and laundry.

Applications, stating age, qualifications, and experience, together with a copy of three testimonials, to reach the undersigned at once.

J. LAWRENCE MEARS, Secretary-Superintendent.

10th April, 1942.

Royal Cornwall Infirmary, Truro.

(285 Beds—4 Residents.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a SENIOR HOUSE SURGEON (B2) in charge of the Male and Female Surgical Wards, including R practitioners who now hold A posts when appointment will be limited to six months. The salary is at the rate of £225 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to—

W. E. GRENFELL, Honorary Secretary.

Truro, 14th April, 1942.

City of Birmingham.

ROMSLEY HILL SANATORIUM. (120 Beds.)

Applications are invited from registered medical practitioners for a RESIDENT ASSISTANT MEDICAL OFFICER (Male or Female), B1 post. Candidates must be unmarried and have held resident hospital appointment since qualifying. Experience in the diagnosis and treatment of tuberculosis will be a recommendation. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. The appointment will be limited in the first instance to six months, and, subject to satisfactory service, may be extended for a further six months. The salary will be at the rate of £350 per annum, with board and residence.

Forms of application may be obtained from the MEDICAL SUPERINTENDENT, Romsley Hill Sanatorium, Halesowen, near Birmingham, and should be returned to him not later than 8th May, 1942.

Warneford General Hospital,

LEAMINGTON SPA.

Applications are invited from registered medical practitioners, Male and Female, for the combined post of HOUSE SURGEON AND CASUALTY OFFICER (A), to become vacant on the 9th May, 1942, including R practitioners within three months of qualification when appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to—

W. A. JAMES, House Governor and Secretary.

Royal Berkshire Hospital, Reading.

The Board of Management invites applications for the appointment of HONORARY ASSISTANT PHYSICIAN.

Candidates must be medical graduates of one of the universities of the British Empire and their names entered on the Medical Register.

The appointment is temporary and is terminable within twelve months of the conclusion of hostilities.

Canvassing on the part of a candidate or on his behalf will disqualify him.

Candidates are required to provide six copies of their application and testimonials, which must be addressed to the Secretary and reach him not later than 9 A.M. on Wednesday, 20th May, 1942.

No testimonials will be required from candidates who are members of the existing Medical Staff.

The election will be held on 2nd June, 1942.

By Order,

H. E. RYAN, Secretary and House Governor.

City of Birmingham.

SELLY OAK HOSPITAL. (500 Beds.)

Applications are invited from registered medical practitioners, including R practitioners who now hold A posts, for the appointment of TEMPORARY ASSISTANT GYNÆCOLOGIST AND OBSTETRICIAN (B2). To R practitioners appointment will be limited to six months; otherwise it will be for a period of one year. The salary is at the rate of £300 per annum, plus war bonus, plus residential emoluments. Applicants must have had previous experience in this type of work.

Applications, stating age, experience, and qualifications, together with copies of three recent testimonials, should be sent to the MEDICAL OFFICER OF HEALTH, Public Health Department, Congreve-street, Birmingham, 3, to reach him not later than 1st May, 1942.

County Borough of Reading.

BATTLE HOSPITAL. (Total 608 Beds.)

Applications are invited from registered medical practitioners (Male) for the post of RESIDENT ASSISTANT MEDICAL OFFICER (B2) for general duties. R practitioners holding A posts are invited to apply when appointment will be limited to six months; otherwise it may be renewed. Salary will be at the rate of £300 per annum, plus residential emoluments for a single man.

Application forms may be obtained from the undersigned and should be returned to him immediately.

Town Hall, Reading. C. S. JOHNSON, Town Clerk.

County Borough of Oldham.

BOUNDARY PARK GENERAL HOSPITAL.

Applications are invited from unmarried registered medical practitioners, Male or Female, for the appointment of RESIDENT ASSISTANT MEDICAL OFFICER (A), including R practitioners within three months of qualification, when appointment will be for a period of six months. The successful candidate will be elegible for re-appointment for a further period of six months.

The salary is at the rate of £200 per annum (plus cost of living bonus) with full residential emoluments.

The Hospital comprises 430 Beds, with facilities for gaining experience in medicine, surgery, midwifery and the diseases of children.

Application forms and conditions of service should be obtained from the Medical Officer of Health, Town Hall, Oldham, and should be returned endorsed "Assistant Resident Medical Officer" not later than 11th May, 1942.

THOMAS ALKER, Town Clerk.

Town Hall, Oldham, 20th April, 1942.

County Borough of Dewsbury.

Applications are invited from duly qualified and registered medical practitioners for the post of TEMPORARY ASSISTANT MEDICAL OFFICER OF HEALTH AND ASSISTANT SCHOOL MEDICAL OFFICER (Male or Female), to take the place of the present holder of the post, who has been called for service with H.M. Forces.

The duties include School Medical Work, Maternity and Child Welfare, and Infectious Diseases.

The salary is £500 per annum plus present cost of living bonus of £24 per annum, rising by annual increments of £25 to a maximum of £700.

Particulars of the duties and terms and conditions of the appointment, together with application form, may be obtained from Dr. J. F. Galloway, Medical Officer of Health, Public Health Department, Municipal Buildings, Halifax-road, Dewsbury, to whom applications, accompanied by copies of not more than three recent testimonials, should be delivered not later than Friday, 8th May, 1942.

Canvassing in any form will be a disqualification.

HOLLAND BOOTH, Town Clerk.

Town Hall, Dewsbury, 20th April, 1942.

Bradford Children's Hospital.

HOUSE SURGEON (A) (Male or Female) wanted immediately. R practitioners within three months of qualification are invited to apply, when appointment will be for a period of six months. Salary £150 per annum, with board, residence, and laundry.

Applications, stating age and nationality, with recent testimonials, should be sent to—

J. W. LONGLEY, Secretary-Superintendent.

County Council of Durham.

Applications are invited from married and single Women for the post of TEMPORARY ASSISTANT WELFARE MEDICAL OFFICER at a commencing salary of £600 per annum, rising by annual increments of £25 to £700 per annum, plus cost-of-living bonus. Travelling allowance will be paid by the County Council in accordance with a scale to be approved from time to time.

The appointment will be subject to the regulations for the time being of the County Council relative to the payment of salary in the case of sickness, and will be terminable by one month's notice on either side. The appointment will be also subject to the following conditions:—

(1) The officer appointed must be a registered medical practitioner over the age of twenty-five years; must devote the whole of her time to the duties of the office; and must not engage in private practice.

(2) She should either have had a previous appointment as Medical Officer of an antenatal clinic, with the approval of the Minister of Health, or have had at least three years' experience in the practice of her profession and special experience of practical midwifery and antenatal work. The holding of a Diploma in Public Health will be deemed an additional qualification for the post.

(3) She will be subject to the directions of the County Medical Officer of Health.

(4) She will be required to reside in Durham City, or such other place as required by the Council.

(5) She must be prepared to undertake any duties in connexion with the Health Services of the County Council, including attendance at Birth Control Clinics.

(6) She must be prepared, if called upon, to act as locum tenens for other members of the medical staff of the County Medical Officer of Health.

(7) The candidate will be required to pass the County Council's medical examination, and will be subject to the provisions of the Local Government Superannuation Act, 1937.

Applications, endorsed "Assistant Welfare Medical Officer," with copies of not more than three recent testimonials, should be addressed to the County Medical Officer of Health, Shire Hall, Durham, and must be received by him not later than Saturday, 2nd May, 1942.

J. K. HOPE, Clerk of the County Council.

Shire Hall, Durham, 11th April, 1942.

Coventry and Warwickshire Hospital.

APPOINTMENT OF CASUALTY OFFICER (B2), HOUSE SURGEON (B2), AND HOUSE SURGEON (A).

Applications are invited from registered medical practitioners, Male and Female, for the above appointments, including, in the case of the B2 appointments, R practitioners who now hold A posts, and including R practitioners within three months of qualification for the A post. To R practitioners the appointments will be limited to six months. Salary at the rate of £150 per annum, plus £20 cost-of-living bonus, and full residential emoluments. The appointed candidates will be expected to take up duties on the 1st May, 1942.

Applications for the above posts, stating age, nationality, qualifications with dates, experience and details of previous appointments, and accompanied by copies of not more than three recent testimonials, should be addressed to the HOUSE GOVERNOR AND SECRETARY, Coventry and Warwickshire Hospital, Coventry.

Hull Royal Infirmary.

Applications are invited from registered medical practitioners for the post of CASUALTY OFFICER (A), vacant May. R practitioners within three months of qualification may apply, when appointment will be limited to six months. Salary at the rate of £175 (plus £25 war bonus) per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of recent testimonials, should be sent to: R. J. CARLESS, House Governor.

Llanelly and District General HOSPITAL. (148 Beds plus 100 Beds, ANNEXE.)

Applications are invited from registered medical practitioners, Male or Female, for the appointment of SENIOR HOUSE-SURGEON AND ANÆSTHETIST (B2) including R practitioners who now hold A posts.

To R practitioners the appointment will be limited to six months. Salary according to experience and qualifications, with minimum of £200 per annum.

Applications, stating age, qualifications with dates, nationality, and present post, accompanied by copies of three recent testimonials, should be sent immediately to—

T. E. PIPE, Secretary.

Royal Isle of Wight County Hospital, RYDE.

Applications are invited from registered medical practitioners (Female) for the appointment of a HOUSE SURGEON (B2), to become vacant on 1st May next. The appointment will be for six months. Salary at the rate of £180 a year, with board, residence, and laundry. As this is the senior post, previous surgical experience is advisable.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent as soon as possible to—

A. S. GORDON, Secretary.

Lancashire County Council. PUBLIC HEALTH DEPARTMENT.

COUNTY HOSPITAL, WHISTON, Near PRESCOT.

Applications are invited from registered medical practitioners (Male or Female) for the appointment of RESIDENT MEDICAL OFFICERS (B2), including R practitioners who now hold A posts. The Hospital is a general hospital dealing with acute work and comprises 1300 Beds. Two posts are vacant, and in one case experience in maternity work will be an advantage. To R practitioners the appointment will be limited to six months; otherwise the successful applicants will be eligible for reappointment for a further period of six months. The salary is at the rate of £250 per annum, with the usual residential emoluments.

The persons appointed will be required to take up duty as early as possible. Forms of application may be obtained from the County Medical Officer of Health, Hospital and Medical Department, County Offices, Preston, to whom all applications, accompanied by copies of not more than two recent testimonials, must be forwarded not later than Monday, the 4th May, 1942.

GEORGE ETHERTON, Clerk of the County Council.

County Offices, Preston, 10th April, 1942.

Lancashire County Council.

The Lancashire County Council propose to appoint a Whole-time TEMPORARY ASSISTANT COUNTY MEDICAL OFFICER (Male or Female) and invite applications from registered medical practitioners who should possess a Diploma in Public Health.

The duties of the post include the medical inspection of school-children, maternity and child welfare work, general public health work, and such other duties as may from time to time be imposed by the County Council.

The salary will be at the rate of £800 per annum, together with allowances for travelling, &c.

Applications must be made upon a form which can be obtained, together with further particulars, from the County Medical Officer of Health, School Medical and Child Welfare Department, County Offices, Preston, to whom the completed forms should be returned not later than the 2nd May, 1942. All communications must be endorsed "Assistant County Medical Officer."

Any form of canvassing is strictly forbidden and will disqualify. GEORGE ETHERTON, Clerk of the County Council.

County Offices, Preston, April, 1942.

Isle of Ely County Council. TEMPORARY ASSISTANT COUNTY MEDICAL OFFICER.

Applications are invited from duly qualified persons of either sex for the above-mentioned appointment, at a salary of £600 per annum, rising by annual increments of £25 to £700 per annum. Experience in mental deficiency or refraction work will be considered an advantage. The provision of a car will be required, and travelling expenses will be allowed in accordance with the Council's scale.

The officer appointed will be required to devote his or her whole time to the duties involved. The appointment will be for the duration of the war, or for such other period as may be necessary, and will be subject to one month's notice on either side.

Applications, accompanied by copies of not more than two recent testimonials, should reach the County Medical Officer, County Hall, March, not later than the 30th April, 1942.

Canvassing, directly or indirectly, will disqualify.

R. F. G. THURLOW, Clerk of the County Council.

County Hall, March, 13th April, 1942.

City of Nottingham. CITY ISOLATION HOSPITAL AND SANATORIUM.

Applications are invited for the post of RESIDENT MEDICAL OFFICER (B2), unmarried, Male or Female, at the above Hospital of approximately 200 Beds. Salary £250 per annum (plus war bonus), together with board, residence, and laundry. Suitably qualified R practitioners holding A posts may apply when appointment will be for a period of six months; otherwise will be renewable for a further six months. Preference will be given to candidates who have held a resident appointment in a general hospital. The holding of the D.P.H., although not essential, would be an additional qualification.

Application forms, to be obtained from me, should be returned forthwith.

J. E. RICHARDS, Town Clerk.

The Guildhall, Nottingham, April, 1942.

City of Birmingham. MATERNITY AND CHILD WELFARE DEPARTMENT.

TEMPORARY WOMEN MEDICAL OFFICERS are required for a period commencing on 8th May, 1942, and terminating on 27th October, 1942, and also for the duration of the war. The work includes attendance at antenatal clinics and children's clinics. Applicants should have had experience in work with mothers and children, including a six months' resident post in a maternity hospital and in a children's hospital. The salary offered is £10 per week.

Applications, endorsed "Temporary Medical Officer," and accompanied by copies of three recent testimonials, to be made on a form obtainable from the MEDICAL OFFICER OF HEALTH, Council House, Birmingham, 3, and returned to him on or before 2nd May, 1942.

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City of Manchester.
WITHINGTON HOSPITAL. (1150 Beds.)

(1) TEMPORARY APPOINTMENT OF RESIDENT ASSISTANT MEDICAL OFFICER (B1) TO THE TUBERCULOSIS WARDS.

Applications are invited from registered medical practitioners, Male or Female, for the above temporary appointment, which will become vacant at the end of June.

The tuberculosis wards contain approximately 150 Beds and are used for the diagnosis and treatment of all types of pulmonary tuberculosis within the City.

(2) TEMPORARY APPOINTMENT OF RESIDENT OBSTETRICAL OFFICER (B1).

Applications are invited for the above temporary appointment from Male and Female registered medical practitioners. Candidates must have had previous experience in obstetrics and gynæcology, and preference will be given to those holding a higher qualification. The department in the Hospital contains 130 midwifery Beds and 32 gynæcological Beds.

Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply for these vacancies.

Each post carries a basic salary commencing at £350 per annum, rising by annual increments of £25 to a maximum of £450, with board, residence, and laundry in addition. A temporary cost-of-living wages award is payable in addition to the basic salaries.

Each appointment is subject to the Manchester Corporation conditions of service.

Full information of either post and forms of application may be obtained from the Medical Officer of Health, Hospitals Administration Section, P.O. Box 399, Town Hall, Manchester, 2, and all applications must be received by him not later than 4th May, 1942.

Canvassing in any form is prohibited.

R. H. ADCOCK, Town Clerk.

Town Hall, Manchester, 2, 10th April, 1942.

Royal Manchester Children's Hospital,
PENDLEBURY, Near MANCHESTER.

Applications are invited for the post of RESIDENT SURGICAL OFFICER (B1). Salary £150 per annum. The appointment is for a period of six months commencing 1st June, 1942. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply.

Applications, stating age, and accompanied by copies of not more than three recent testimonials, to be sent to the undersigned not later than Monday, 4th May. Canvassing, directly or indirectly, may disqualify.

By Order.

H. HEARDMAN, General Superintendent and Secretary.

Hampshire County Council.
THE COUNTY COUNCIL HOSPITAL, ST. PAUL'S HILL, WINCHESTER.

RESIDENT HOUSE OFFICER (Male or Female) required at this Hospital at a salary of £150 per annum (A post). R practitioners within three months of qualification may apply when appointment will be for a period of six months; otherwise may be extended to twelve months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three testimonials, should be sent not later than the 1st May to—

H. LESLIE CRONE, County Medical Officer.

The Castle, Winchester.

The Royal Hospital, Wolverhampton.
(Incorporated under Royal Charter.) (310 Beds.)

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for the following post: HOUSE SURGEON (A). Duties to commence forthwith. Salary at the rate of £100 per annum, with full residential emoluments. The appointment is for six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent immediately to—

9th April, 1942. W. H. HARPER, House Governor.

Royal Albert Edward Infirmary
AND DISPENSARY, WIGAN. (Normally 189 Beds.)

Applications are invited from registered medical practitioners (Male) for the appointment of a HOUSE SURGEON (A), now vacant. R practitioners within three months of qualification may apply, when appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent as soon as possible to—

A. STANLEY BRUNT, General Superintendent and Secretary.

The Southampton Children's Hospital
AND DISPENSARY FOR WOMEN.

Applications are invited from registered medical practitioners, Female, for the appointment of a RESIDENT MEDICAL OFFICER (A), now vacant. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by three recent testimonials, should be sent immediately to: ELLA K. MATTHEWS, Secretary.

Huddersfield Royal Infirmary.
(321 Beds.)

Male CASUALTY OFFICER (B2) required to commence duty as soon as possible. R practitioners who now hold A posts are invited to apply. Salary £200 per annum, with board, residence, and laundry. Appointment for six months, subject to renewal for a similar period. To R practitioners the appointment will be limited to six months. The Hospital is officially recognised for the surgical practice required of non-members before admission to the Final Fellowship Examination of the Royal College of Surgeons of England.

Applications, with copies of three recent testimonials, to be addressed immediately to—

H. J. JOHNSON, General Superintendent and Secretary.

Beckett Hospital, Barnsley.

Applications are invited from registered medical practitioners for the appointment of RESIDENT SURGICAL OFFICER (B1), to become vacant on 1st May. Applicants should have held house appointments and had surgical experience. Suitably qualified R practitioners holding B2 or B1 appointments may apply. Preference will be given to candidates holding diploma of F.R.C.S. Salary is at the rate of £350 per annum.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent as soon as possible to—

ARTHUR L. BOURNE, Secretary-Superintendent.

31st March, 1942.

York County Hospital.
(222 Beds.)

Applications are invited from registered medical practitioners for the following appointment, which falls vacant on the 1st May, 1942: HOUSE SURGEON (B2), for which R practitioners holding A posts may apply. To R practitioners appointment will be limited to six months. Salary is at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent immediately to—

J. R. MACKRILL, Secretary.

Borough of Preston.
SHAROE GREEN HOSPITAL. (250 Beds.)

Applications are invited from registered practitioners for the post of ASSISTANT FEMALE RESIDENT MEDICAL OFFICER (B1). Salary £350, rising to £450 plus war bonus, with full board and residence. Previous experience in midwifery is essential, the duties consisting mainly of obstetrical work (35 Maternity Beds).

Applications, stating age, qualifications, and experience, with testimonials, to be sent by 2nd May.

H. E. NUTTER, Town Clerk.

Dundee Royal Infirmary.

The Directors invite applications for the appointment to the Honorary Staff of an ASSISTANT VISITING OBSTETRICIAN AND GYNÆCOLOGIST. Particulars of duties, &c., may be obtained from the Medical Superintendent.

Applications, and recent testimonials (twenty-four copies of each), should be lodged with the undersigned on or before 16th May, 1942.

Royal Infirmary, Dundee. W. F. FERGUSON, Secretary.

Sudan Medical Service.

Applications are invited for VACANCIES still existing in the Sudan Medical Service. Candidates must be men under thirty years of age and unmarried. Preference will be given to those who have held B appointments; some surgical experience since qualification is essential. Many members of the Service hold temporary commissions—e.g., when attached to the Sudan Defence Force or seconded for other war-time duties. Pay commences at £E720 per annum (the equivalent of £738 sterling).

Dr. SQUIRES, from whom application forms and further particulars may be obtained, would be glad to interview intending candidates as soon as possible at 93, Harley-street, W.1; Telephone No. WELbeck 3423.

Applications are invited from fully
qualified medical practitioners, over military age, preferably with either industrial experience or with D.P.H. degree, for full-time appointment as MEDICAL OFFICER to a large industrial concern, engaged upon essential war work, with factories in the Greater London area. Salary £650–£800 per annum, according to qualifications.

Write, giving details of age, qualifications held, and professional experience, to "M.O.," Box 677, A.K. Advertising, 4, Talbot-mansions, Museum-street, W.C.1.

Old-established Practice in West
Country Village. Receipts about £1500–£1600. Panel £500. Two appointments—M.O.H. £120, Poor Law £120. Good house, £1700; garden with tennis court. Books kept up to date by bookkeeper. Willing to meet prospective purchaser more than half-way for early sale.—Address, No. 865, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Microscope wanted.—Full particulars
to: "Primroses," South Sway, Hampshire.

CONSTIPATION

The softening of impacted fæces and lubrication of the bowel may be effected by any good mineral oil emulsion. But more than this is needed if the intestinal tract is to be cleared of those organisms which are responsible for the putrefactive and fermentative processes always associated in some degree with chronic constipation. Emulsion Lactobacillus Acidophilus alone fulfils this need. The vast numbers of viable L. acidophilus which this unique emulsion contains enable it to exert this important detoxicative effect.

Proof of the superiority of E.L.A. is seen in the great change brought about in the intestinal flora following its regular administration and the pronounced and rapid clinical improvement in cases of auto-intoxication.

EMULSION
LACTOBACILLUS
ACIDOPHILUS

Bottles of 12 oz., 4/7 nett

(Price includes Purchase Tax and Professional Discount)

PEPTIC ULCER

The endonasal application of specially prepared posterior pituitary in powder form has provided an interesting development in the medical treatment of peptic ulcer. Reports so far published, from both English and American sources, indicate the important position which this new treatment promises to occupy.

The treatment consists of a course of twenty-eight powders—Pituitary Powders (Spicer)—one of which is used as a snuff night and morning for fourteen consecutive days. Apart from the specific effect (American workers report improvement of varying degrees in 88 per cent. of their cases), gains in weight, strength and appetite are usual. The percentage of recurrences is small.

A pamphlet dealing fully with the treatment is available and will be gladly sent to interested physicians.

PITUITARY POWDERS
(SPICER)

Boxes of 28 powders, 28/9 nett

(Price includes Purchase Tax and Professional Discount)

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